THE AGRICULTURAL FINANCING GAP IN ZIMBABWE: RATIONING, SUSTAINABLE CREDIT ACCESS AND PARTICIPATION IN RURAL FINANCIAL MARKETS.

BY

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ABSTRACT

The study is an examination of agricultural finance for smallholder communal farmers in Zimbabwe. It is accepted as reality that generally in Africa and particularly in Zimbabwe there exists a gap between the supply of and demand for credit among communal rural farmers. There have been previous attempts by governments to close the finance gap through supply of cheap credit but these efforts have neither been successful nor sustainable. The gap has been sustained by arguments that financing rural agriculture has high transaction costs, low returns on investment and is risky business. Formal financial services providers prefer to provide loans to well established urban businesses, rather than numerous small loans to scattered rural farmers in remote areas where transport, communication, energy and farm infrastructure are underdeveloped. The result is a serious and long lasting rural finance gap that keeps the economic potential of agriculture underused. Banks require collateral security from farmers but this is a major constraint due to land tenure restrictions.

There have been some studies around the subject of rural financing and rural financial markets. A review of literature reveals that not much has been invested in studying the determinants of access to rural financing and of credit rationing for smallholder farmers by formal financial institutions in Zimbabwe. The empirical methods used in this study have not been employed in Zimbabwe to identify and recommend policy options to close the finance gap.

The specific objectives were to i) to identify and examine the determinants of access to agricultural financial markets for smallholder farmers in Zimbabwe, and ii) to assess credit rationing as a result of the demand for loans exceeding the supply, by identifying and examining the determinants of credit rationing among smallholder farmers in Zimbabwe. Objective (iii) would draw from objectives (i) and (ii) to recommend policy options and financing models to close the rural agricultural finance gap for sustainable and smallholder inclusive rural financing for agricultural value chains in Zimbabwe. Cross

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sectional data was collected from a random samples of smallholder farmers residing in purposively selected wards and used for empirical analysis. The analysis used the double huddle model to determine the determinants of access and intensity of participation of farmers in rural financial markets. The seeming Unrelated Regression (SUR) model was used to analyse the determinants of credit rationing. Credit rationing was sub classified into quantity rationed, risk rationed and price rationed farmers. The analysis of credit rationing in three different categories using the SUR model shows the effects of the explanatory variables in a more critical manner that provides a better understanding of the determinants of credit rationing among small-scale farmers.

Smallholder farmers' perception of risk affects access to agricultural financial markets. Rain-fed agriculture has a high risk of crop and livestock failure due to variability and unpredictability in weather patterns and climate change related extreme weather events including droughts and floods. The results also showed that farmers in remote areas that are distant from the formal financial markets have less access to credit facilities. Communal smallholder farmers in Zimbabwe face significant levels of credit rationing in various forms. Credit demand is in excess of supply at various interest rates. Credit availability is a more critical issue in Zimbabwe than interest rates.

Key policy interventions that can improve access to agricultural financial markets include improving extension contact in order to improve crop and livestock productivity, which in turn will improve farmers' profitability and ability to repay farm credit. Infrastructure development including the development of rural growth points in remote areas can attract financial service providers to decentralise and reduce the distance to the financial services markets, transaction costs and interest rates. There is need for the Government of Zimbabwe (GoZ), to formulate and implement a Rural Finance Policy and Strategy to address the access and credit rationing challenges. The policy should facilitate development of financial sector infrastructure that enables broadening outreach in remote areas through establishment of effective

payment systems, credit reference bureaus, warehouse receipts, collateral management and weather indexed insurance. Linkages between community based Member Owned Financial Institutions (MOIs) and formal financial services providers will contribute to addressing the rural finance gap.

PLEGIARISM DECLARATION

I, *Prince Jonathan Tutsirai Kuipa* declare that:

1. The research reported in this thesis, except where otherwise indicated, is my own original research.

2. This thesis has not been submitted for any degree or examination at any other university.

3. This thesis does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from those persons.

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Signed: _____   Date_____

      Yohan Van Niekerk (Co-Supervisor)

DEDICATION

This thesis is dedicated to my mother, my late father, my wife Ethel, my late wife Blessing and my children

ACKNOWLEDGEMENTS

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LIST OF ABREVEATIONS AND ACRONYMS

ADB   Asian Development Bank

AFC   Agricultural Finance Corporation

AFD   France Development Agency

AfDB   African Development Bank

AFI   Alliance for Financial Inclusion

AFRACA   African Rural and Agricultural Credit Association

AML   Anti Money Laundering

ASA   American Statistical Association

ASCA   Accumulating Savings and Credit Association

ATM   Automated Teller Machine

BRAC   Building Resources Across Communities

BRI   Bank Rakyat Indonesia

CGAP   Consultative Group to Assist the Poor

CSC   Cold Storage Commission

D-Miro   Banko D-MIRO

DFI   Development Financial Institutions

EIB   European Investment Bank

FAO   Food and Agricultural Organisation of the United Nations

FTLRP	Fast Track Land Reform Programme
GDP	Gross Domestic Product
GNP	Gross National Product
GoZ	Government of Zimbabwe
IFAD	International Fund for Agricultural Development
ISAL	Internal Savings and Lending
KFW	German Development Bank
LFSP	Livelihoods and Food Security Programme
LWR	Lutheran World Relief
MFI	Micro Finance Institution
Mfw4a	Making finance work for agriculture
MNO	Mobile Network Provider
MOI	Member Owned Institution
MSME	Micro Small and Medium Scale Enterprises
MYRAD	Mysoe Resettlement and Development Agency
NBFI	Non-Bank Financial Institution
NGO	Non Governmental Organisation
OECD	Organisation for Economic Cooperation and Development
PPF	Production Possibility Frontier
RBZ	Reserve bank of Zimbabwe
RFI	Rural Financial Intermediaries

ROSCA	Rotating Savings and Credit Association
SACCO	Savings and Credit Cooperatives
SG	Savings Group
SHG	Self-Help Group
SSA	Sub-Saharan Africa
STATA	Data Analysis and Statistical Software
SUR	Seemingly Unrelated Regression
TLU	Tropical Livestock Unit
UDI	Unilateral Declaration of Independence
UNIDO	United Nations Industrial Development Organisation
USA	United States of America
USD	United States Dollars
VCF	Value Chain Finance
VSLA	Village Savings and Loan Scheme
WOCCU	World Council of Credit Unions
ZAMFI	Zimbabwe Association of Micro Finance Institutions
ZFU	Zimbabwe Farmers Union

CHAPTER 1.INTRODUCTION

1.1. Background

Just over half of the world's adult population is unbanked, most of them poor: In Africa, four out of five adults are unbanked, and in South Asia, three out of five (Chaia et al. 2009). In rich countries, by contrast, fewer than one in ten adults lack a formal means to save or to borrow (Chaia et al. 2009). All these numbers—of the extremely poor, the moderately poor, and the unbanked poor—dwarf the number of clients already served by microfinance, estimated at 190 million at the end of 2009 (Reed, 2011).

There are an estimated 500 million smallholder farmers in low- and middle-income countries (Rutten & Boto, 2014). In agriculture the term 'smallholder' refers to their limited resource endowments relative to other farmers in the sector, hence the definition of smallholder farmers differs between countries and between agro-ecological zones (Dixon, et al 2004). Of the two-thirds of sub-Saharan Africa's rural population, the majority can be classified as smallholder farmers (FAO, 1997).

Smallholder farming is the backbone of African agriculture and food security (Dixon et al., 2004) yet they have had very little access to financial service and very little progress has been made to address this financing gap (IFAD, 2016; AFI, 2013; World Bank, 2013) Most African countries' economies rely on a backbone of agriculture. Agriculture is the main source of income for 90% of Africa's rural population and it provides 60% of the labour force (Rutten & Boto. 2014; (FAO, 2016; Kanu, Salami, & Namasawa, 2014; Jaune, Chamberlain, & Headey, 2014). Lack of infrastructure, the rural low income levels, high transaction costs, dry land farming and lack of scale economies has resulted in financial institutions lacking interest to service this sector (World bank 2007). Kipsang, 2008 reported that only 4% of Africa's rural

populations have a bank account and only 1% has access to financial services from financial institutions.

The gap in providing rural financial services results from supply side constraints include bad roads, erratic electricity supply and underdeveloped communication systems which make it difficult for service providers to reach rural farmers (Gobezie, 2005; Smith, 2001; Parikh, 2006; Accion, 2017; LWR, 2012). The gap also results from demand side constraints include poor communication and transport infrastructure, poor farmers who are risk averse, low financial literacy, exclusion of women by the male dominated patriarchal systems and insecurity of tenure, which limits financial service provider's options for collateral security (Gobezie, 2005). A detailed review of the gap in rural financial markets is done in section 2.8 of this thesis.

Rutten & Boto, (2014) observed that Governments and Non-Governmental Organizations (NGOs) distort the banking environment. These players flood the rural economy with subsidized farming inputs making it difficult for banks to compete and crowding out formal financial institutions. Often the farmers' mind-set has shifted towards ever expecting these organizations to provide humanitarian assistance even when there is neither disaster nor crises. As an example is when the government usually regulates grain prices to safeguard food security.

An analysis of financing agriculture in Zimbabwe by Zumbika (2006) reveals that financial institutions providing services to rural areas are inefficient and not sustainable. The analysis also reveals that there is an apparent trade-off between sustainable rural credit as measured by the profit motive and outreach defined by the institution's ability to reach out to farmers. Zumbika (2006) points out that the agricultural finance policies adopted to date in Zimbabwe have been inefficient and have failed to promote growth and equity.

Mukwezera & Manzungu, (2003) in a historical overview of rural financing in Zimbabwe states that the formal institutions that supported communal areas in Zimbabwe in the past were Agricultural Finance Corporation (AFC), the Cold Storage Commission (CSC), and commercial banks. The AFC was a public lending institution servicing communal areas, small scale and large commercial farmers. The CSC, a beef marketing parastatal, provided loans for farmers across the board for livestock development. The AFC was the successor to the Land and Agricultural Bank of the then Southern Rhodesia that was established in 1924 to assist all categories of farmers. Between 1945 and 1968 the Land and Agricultural bank provided medium to long term financing to smallholder farmers. After 1968 lending to small-scale commercial farmers was taken over by the African Loan Fund, an arm of the then Ministry of Internal Affairs. In 1979 the first AFC portfolio of 2,846 loans amounting to Z$478,000 were granted to smallholder farmers. The loans grew to 18,000 in 1980/81 amounting to Z$4.8 million (AFC, 1990). The AFC was dependent on government resources for lending. It therefore had economic and social obligations. Thus it gave loans at 13per cent between 1981 and 1991 while the rate of inflation was 15 per cent. This translated into huge losses of $0.06 per dollar lended to communal land farmers. 91 per cent of the loans granted were short term. By January 1990, 80% of communal land farmers were in arrears. In an effort to reach out to more farmers and to manage default the AFC launched the group-lending scheme in 1989/90 (AFC, 1990).

Mukwezera & Manzungu, (2003) observe that in all these efforts and typical of most developing countries, credit only reached about 10% of smallholder farmers.

A closer look at smallholder value chains reveals that small and numerous farmers are part of wider value chains. The asset poor farmers are connected with large businesses inclusive of traders, processors and supermarket chains. It therefore emerges that there is need to address the financial gap

that limits growth, retards agricultural development and ignores millions of potential smallholder agricultural entrepreneurs. The question is "what financing model can address these constraints and risks?"

This study is about agricultural financing, it is about financial inclusion and participation in rural financial markets by smallholder farmers. It is meant to enhance understanding of the impediments to rural financial inclusion and how they can be militated. The study will assist informal and formal financial service providers and policy makers to develop strategies for financial inclusion of rural smallholder communal farmers in Zimbabwe.

Studies on rural financing abound but still the rural finance gap persists. Many studies have been done but results of the studies cannot be generalized because of country specific socio economic circumstances. This study also differs from previous studies by using a sustainable agriculture approach. This approach is unique in that it examines the rural finance gap through a sustainable agriculture-financing lens to identify and prioritize policy interventions that can sustainably address rural financial exclusion. In line with pillars of sustainable agriculture postulated by Smyth and Dumanski (1995) the study will explore policy options that pay attention to productivity, economic viability, risk mitigation and social acceptability to address the agricultural finance gap in Zimbabwe. According to Helms and Pearce (2001) sustainable financial services in rural sub-Saharan Africa requires overcoming poor communications, limited infrastructure, low population density, high illiteracy, and high-risk economic activities that are relatively undiversified.

The importance of agricultural finance is that it is a means to address rural poverty and livelihoods. Smallholder farmers can graduate from subsistence to commercial, earn significant profit margins and escape poverty through access to agricultural finance. Attempts to close the rural finance gap come with real and perceived challenges including high transaction costs, risks associated with rain-fed agriculture, high cost of money and low savings.

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Communal farmers may access government loans but this has been cited as crowding out private financiers from rural finance markets. Government funding has been found to be unsustainable resulting in a shift towards the financial systems approach.

The study aims to identify the means of addressing the rural and agricultural finance gap that are sustainable and that involve all players; farmers, NGOs and formal finance institutions in rural financial markets.

Empirical studies of this nature for Zimbabwe are scarcely available and the results will be instrumental in increasing financial inclusion, which is key for all of Zimbabwe's evolving economic recovery blueprints since independence in 1980.

Studies in agricultural financing are many but this study's contribution is an investigation on Zimbabwe's rural financial markets in respect of the supply and demand gap for these services. The study's contribution over and above providing policy recommendations to address the rural finance gap in Zimbabwe is intended to inform and perhaps convince financial services players that this supply and demand gap can be narrowed by using innovative financing mechanisms.

1.2 Research Problem and justification

The rural smallholder sector has been and remains inadequately serviced by financial institutions and other financial systems. This is reflected by the distribution of the financial service providers as described by Zumbika (2006). In 1990 16.5% of all building societies had presence in communal areas where 70% of the country's population resides (Zumbika, 2006). Zumbika (2006) further notes that the credit needs of communal farmers were largely met by informal loans and savings schemes, Non-Governmental and church organizations, the Savings Development Movement, input suppliers such as Windmill Fertilizer Company and the Association of Women's Clubs. Mago (2013) observed that financial service providers have traditionally thought of

financing smallholder sector as characterized by high transaction costs, low returns on investment and high risk. Financial institutions regard small-scale farmers as non-bankable. Commercial banks prefer to provide loans to established large businesses rather than small loans to numerous micro-entrepreneurs (Rutten & Boto, 2014). As a result there is a yawning smallholder farmer financing gap that has kept Zimbabwe's economic potential untapped. This gap needs solutions and offer opportunity for transforming smallholder farming from subsistence to commercial. Micro finance institutions have attempted to fill this gap. RBZ (2006) acknowledges that the financial needs of small agribusiness remain underserved. As observed by Rutten & Botto (2014) their financial needs are too large for microfinance and too small for commercial banks.

In Zimbabwe, access to credit by farmers is still very low. The constrained access has been confirmed by a number of studies of Zimbabwe's smallholder farmers. The studies found out that the majority of smallholder farmers used owners' savings as the primary source of agricultural finance (McPherson, 1998, Tevera, 1998; Matshalaga, 1998; Chimedza, 2006; and Chipika & Malaba, 2011). Own resouces are seldom enough to cover seasonal cashflows. There has been very little that has been done on this subject in terms of any empirical research. Therefore there is need to investigate the determinants of financial access by smallhoder farmers in Zimbabwe in order to recommend viable policies that can enhance increased access and participation in rural financial markets.

High macro economic instability, asymmetry information leading to moral hazards and adverse selection lead financial institutions to apply credit rationing to reduce the risk of non repayment of loans (Ahiawodzi &Sackey, 2013). Ahiawodzi &Sackey, (2013) also point out that farmers may self-ration and choose not to borrow because of uncertainty regarding their ability to comply with contractual obligations and if the costs of default including loss of assets and legal action are too high.

In Zimbabwe, the smallholder farmer is highly credit rationed compared to their large scale counterparts (Chimedza, 2006). There has been little empirical investication on the determinants of credit rationing in Zimbabwe. This provides the justification for an empirical investigation of credit rationing from both the demand and supply sides.

1.3. Research Purpose and Questions

The first step to be undertaken is to articulate a clear overarching purpose for embarking on a research process. The formulation of lucid research questions is the next step, after which a design process can be undertaken along with the selection of appropriate methods and tools. Havercamp and Young (2007) identify three main types of research purpose, namely: theory or construct oriented; practice or evaluation oriented; and action or change oriented. Newman, Ridenour et al. (2003), however, unpack the issue of research purpose in more detail, including identifying nine possible 'types' of research purpose. They aptly note that a singular research endeavour may have multiple purposes and that this may change the course of the study and "sometimes lead in an unforeseen direction" (pg. 172). The nine tentative, and non- exhaustive possible research purposes identified are: to predict; to add to the knowledge base; to have personal, social, or institutional impact; to measure change; to understand complex phenomena; to test new ideas; to generate new ideas; to inform constituencies and to examine the past. These purposes are not necessarily independent but may overlap.

As such, the overarching purpose of this thesis is articulated below as:

To assess the options for narrowing the rural agricultural financing gap in Zimbabwe, to achieve this goal the thesis researches and attempts to identifies the determinants of access to agricultural financial markets for smallholder farmers in Zimbabwe. It also seeks to assess credit rationing as a result of the demand for loans exceeding the supply. Pursuant to this, the

study investigates the Determinants of credit rationing among smallholder farmers in Zimbabwe.

As explained by Newman, Ridenour et al. (2003), a complex research purpose will often necessitate multiple research questions. The research design for this thesis was shaped to answer three mutual but complimentary research questions, which make equal contributions to the research purpose. These questions are:

1. What are the determinants of access to agricultural financial markets for smallholder farmers in Zimbabwe?
2. What are the determinants of credit rationing for smallholder farmers in Zimbabwe?
3. What policy options can be recommended to close the rural agricultural finance gap for sustainable and smallholder inclusive rural financing for agricultural value chains in Zimbabwe?

In returning to the research purpose typology provided by Newman, Ridenour et al. (2003), the purposes that this thesis most closely align to are: 'to add to the knowledge base', 'to have a personal, social, or institutional impact', and 'to inform constituencies and to examine the past'. The first, 'to add to the knowledge base' should be one of the primary objectives of any doctoral research. The study will also inform constituencies, through policy recommendations that will contribute towards narrowing the agricultural finance gap in Zimbabwe.

The substantive discussion on literature presented in the next chapter provides the context and prevailing arguments to which this research intends to build upon and advance. The review examines the past with the intention of informing the present and the future.

1.4. Methodology

The ontological and epistemological philosophies underpinning the research

have been identified as post positivist in nature as described by Guba and Lincoln (1994). They represent the view that reality is something that can be comprehended, although imperfectly, and that social phenomena can exist independently of social actors. This separate, observable reality can therefore be examined through the use of quantitative methodological tools.

Research questions 1 and 2, are addressed by independent but complementary empirical investigations, which build the basis for addressing the subsequent research question number 3. Research questions, 1 and 2 which are driven by quantitative methodologies, focus on contributing to knowledge and to inform question 3, on recommending policy options for sustainable financial inclusion of smallholder farmers in agro-value chains.

A household questionnaire was administered to a two stage purposive and random sample in a cross section survey. The sample was purposive in selecting wards that would represent all the 5 agro-ecological regions of Zimbabwe and where smallholder farming was predominant. The data collected was analysed using quantitative econometrics techniques.

1.5. Ethical Considerations

Trochim (2006) notes that all social science research activities are expected to adhere to a minimal set of ethical guidelines and acceptable behaviours. These guidelines include the principles of voluntary participation, informed consent, risk of harm, confidentiality and anonymity. All participants were informed of the purpose of the study and that their participation was voluntary. They were also informed that they could refuse to answer any questions they did not feel comfortable answering and they could cease participation at any time. Additionally, it was explained that his or her information would be kept confidential and not shared with anyone not involved in the immediate research team. In the context of this study It was possible to promise anonymity with regards to the household survey. Only minimal information was collected on participants, namely gender, age and vocational status.

There were no foreseeable reasons for why participation would or could result in direct harm to the respondents.

1.6. Summary

The purpose of this chapter has been to set out the motivation and lines of inquiry behind the research in order to provide the necessary context and background for the results that are presented in the following chapters.

The broad purpose for undertaking the study was explained in detail: it should be clear that we are concerned with enhancing our understanding of the relationship between supply and demand for rural agricultural finance, The researcher used a design which called upon quantitative tools to answer two mutual but complimentary research questions.

Chapter Two, will present the results of efforts to understand how rural financial markets work through a desk literature research. The historical evolution of microfinance is studied from the 50s to understand the dominant discourses in various phases of the historical development of microfinance towards contemporary financial systems paradigms. Chapter 4 and 5 will present the findings from the study – whose design and details were mapped out in this chapter. The quantitative data enables the possibility of testing for the most elusive 'cause' and 'effect' of selected variables.

CHAPTER 2. THE FINANCIAL ECOSYSTEM, RURAL FINANCE MARKETS, GAPS IN FINANCIAL INTERMEDIATION, CREDIT RATIONING AND FARMERS SAVINGS GROUPS: A LITERATURE REVIEW

2.1 Introduction

The players in the financial services arena form a financial ecosystem where each has a specific role. There are those who demand financial services, those who supply and others who facilitate the functioning of the ecosystem. These players are connected together by products comprising of different financial services. The products are scarce and need to be efficently allocated to the players in the ecosystem. As a result some of the players are left underserved because of various factors, thereby creating gaps in financial intermediation.

This chapter explores these issues with the objective of understanding how the financial ecosystem operates. The chapter begins with a review of the concept of agriculture finance and goes on to review the role of finance to economic development. A brief overview of rural financial markets is done including a historical perspective from the 1950s through the 21st century to the present. The theoretical concepts of financial exclusion/inclusion and credit rationing in rural financial markets are reviewed. The chapter ends with a duscussion of rural financial institutions and their role in financial intermediation.

2.2. The Concept of Agricultural Finance

This thesis focuses on rural finance, specifically on agricultural finance and is premised on the hypothesis that there is a finance gap for servicing smallholder communal agriculture. It focuses on how savings, credit and production behaviours of smallholder communal farming households relates to the supply of financial services. It is an argument in favour of a financial systems approach as a solution to agricultural development.

It is important at the onset to make a conceptual distinction of related terms around financing for agriculture; *finance, rural finance, agricultural finance, rural credit* and *agricultural credit.* Fabozzi & Drake, (2009) define *finance* as the broadest concept, which encompasses the application of economic principles to decision-making that involves the allocation of money under conditions of uncertainty. The theoretical foundations for finance, thus, draw from the field of economics. They deduce that finance is therefore the broad concept encompassing all the others. Mfw4a.org explains that rural finance comprises the full range of financial services - loans, savings, insurance, and payment and money transfer services - needed, offered, or used in rural areas by household and enterprises. Thus the term encompasses agricultural finance. Mfw4a.org define agricultural finance as encompassing financial services that includes credit, leasing, agricultural insurance, for all players in agricultural value chains including input supply, and production up to marketing. *Rural credit* is a narrower concept that specializes in provision of credit for rural households and firms, not only necessarily agricultural firms. *Agricultural credit* is the most specialized division, which provides credit service only to agricultural firms. Based on this distinction, "*rural financial market*" refers to a market for rural financial services comprising agricultural finance, rural credit, and agricultural credit (Komicha, 2007).

2.3. The Relationship of Finance and Economic Development

To have an insight into the relationship of finance and economic development both at the local and national level it is prudent to have a look at some macroeconomic theories of development. Macroeconomic theories are scientific theories that have been devised to provide insight into the workings of the macro economy (World Bank, 2000). The complex and multifaceted problems of economic development led to the postulations of many theories, clarifications, opinions and affirmations (World Bank 2000). Economic

performance is measured by an annual increase in Gross National Product (GNP). The experience of the 1950s and 1960s has shown that GNP growth would not necessarily result in a better life for a nation's population. Scholars and policy-makers in most developing countries realized that income growth was only one dimension of development (Rossi, 1987; Dupas & Robinson, 2009; Brune, Gine, Goldberg, & Yang, 2010). The goal of development during the period was thus not limited to economic growth but to concentrate on the reduction of poverty, inequality and unemployment (Seers 1979). A broader perspective of development goals is hence necessary as reflected in the World Bank's Development Report (1991) as - To improve the quality of life in developing countries, which generally calls for improved incomes. It incorporates the objectives of better education, improved health and nutrition, poverty reduction, a sustainable environment, equity, fundamental human rights, and a fulfilling cultural life.

The role of microfinance in development has been analysed by Roodman (2013). In questioning whether microfinance works, Roadman (2013) discerns three distinct conceptions of success in microfinance, each corresponding to a different definition of development. Development can be conceived as escape from poverty. In answering the question -Does microfinance and microcredit in particular takes people out of poverty? Roodman (2013) argues that this conception cannot be supported by empirical studies (Rossi, 1987; Dupas & Robinson, 2009; Brune, Gine, Goldberg, & Yang, 2010). Despite microcredit having an impact on stimulating micro-enterprise, as measured by business starts, investment, and profits, results are inconclusive on impact on development-as-escape from poverty.

The second conception of success borrows from the work of Amartya Sen, author of Development as Freedom (1999). For Sen (1999), development goes beyond economic growth. It is control over one's circumstances. Such freedom emanates from many sources: income, assets, education, health, civil rights, political rights. Central to Sen (1991)'s theory is the observation

that freedoms tend to support one another. Education leads to more income, which leads to more education. Financial services for the poor are inherently empowering. They are for helping poor people manage their money, which is central to economic survival. The work, Portfolios of the Poor by Collins et al. (2009) makes this clearer. Collins et al. (2009) illustrates the volatility and unpredictability of income, along with the greater vulnerability to health emergencies that poor people meet. The poor need financial services in order to set aside money in good times and draw it out in bad thus informally, out of necessity, they develop credit, savings, insurance, and transfer services to meet these needs (Von Pischke, 1991). The last conception of success in microfinance, "development as industry building" was fully articulated early in the movement by various scholars (Von Pischke, 1991; Otelo & Rhyne, 1994; Krahnen & Schmidt, 1994).

Roadman (2013) gives examples of institutions built by the microfinance include BRI in Indonesia; the Grameen Bank, BRAC, and ASA in Bangladesh; Pro Mujer in Peru; Bancosol in Bolivia; D-MIRO in Ecuador; Equity Bank in Kenya. He notes that these institutions employ thousands, they serve millions, they compete, and as result they innovate, offering more flexible and diverse services at lower prices.

2.4. The Financial Ecosystem

Financial stakeholders are concerned with the financial ecosystem and how it affects financial inclusion (or exclusion). Financial inclusion efforts focus on how the supply of financial services can better meet demand (Ledgerwood & Gibson, 2013). Ledgerwood and Gibson (2013) further posit that there are three main sets of functions in a market ecosystem, each carried out by the private sector, government, NGOs, community groups, representative associations, and consumers. These functions are explained by the authors as;

• *Core*. Transactions between providers and clients (supply and demand)

• *Rules*. Informal and formal rules that shape the behaviour of market players, including consumers

•*Supporting functions.* The collection of functions that provide information and services supporting the development and expansion of the core.

The key players in the core of the market are clients (demand) and financial service providers (supply), connected to each other by products (supply). Rural farmers demand financial services that are accessible, flexible and of good quality (Collins et al., 2009; Kendall 2010).

Ledgerwood and Gibson (2013) give a very clear classification of rural financial services suppliers. They classify them as community-based (generally informal with no legal status) or institutional (generally more formal and in some cases regulated). In the classification by Ledgerwood and Gibson (2013), informal financial service suppliers include individuals (such as friends and family, money-lenders, shop owners, traders, and deposit collectors) and groups, e.g. Rotating Savings and Credit Associations (ROSCAs) and Accumulating Savings and Credit Associations (ASCAs), and external agency facilitated groups, e.g. Savings Groups (SGs) and Self-Help Groups (SHGs).

Institutional providers include member-owned financial cooperatives and NGOs, which are normally registered and possibly supervised, as well as banks (private and public), deposit-taking MFIs, and non-bank financial institutions (NBFIs) such as insurance companies and leasing companies (Ehrbeck, et al, 2012). In remote rural farming areas, the low cost structure and proximity of user-owned and managed providers constitute significant advantages over more structured MFIs or commercial banks (Glisovic, et al., 2011). However, credit unions and banks have the advantage of being able to offer a wider variety of products and may be more reliable than community-based providers (Lehman, 2010). Mobile network operators (MNOs) can offer services conveniently in rural areas, although relatively few have achieved

scale (Ledgerwood and Gibson, 2013).

Financial products and services are generally defined by standard characteristics such as term, size, price, returns, and eligibility; their appeal to consumers often depends on their reliability, accessibility, flexibility, safety, and affordability (Glisovic, et al., 2011).

Rules and supporting functions influence the effectiveness of transactions in the core of the financial ecosystem and provide an enabling environment to allow markets to grow, adapt, and succeed in changing circumstances (Ledgerwood and Gibson 2013). Rules include formal rules (regulations and standards) and informal rules (social conventions and cultural norms). Informal rules are usually unwritten and are invariably more unclear and ill-defined than formal rules; they manifest themselves in attitudes, behavioural norms, social organizations, and common practices (microLINKS wiki. 2010). Formal rules affect clients by setting legal frameworks and industry standards that influence market access, the range of products, and the competitive land-scape, which, in turn, affect providers and their ability to serve their markets appropriately (Ledgerwood 1998).

In the market ecosystem there are *market players (*providers of financial services, regulators, and other developers and enforcers of formal rules and providers of supporting functions) with a continuing direct role within the market system and *facilitators (*donors and development agencies) that see themselves as external actors with a mandate to act as temporary catalysts in stimulating others in the market (Tilman, 2012)

Supporting functions provide the resources, information, and services that characterise financial market conduct and enable markets to grow, adapt, and succeed in changing circumstances (Ledgerwood and Gibson, 2013). Supporting functions are concerned generally with information and communication, capacity building of various players including policy makers and service providers, coordination by government or representative industry

and consumer associations, resource development by private sector and donors, and innovation all of which support the core function—the exchange between clients (demand) and service providers (supply) (Mas, 2008).

2.5. Financial Inclusion

Ledgerwood (2013) conceptualises financial inclusion as being a multidimensional, and pro-client phenomenon, encompassing increased access, better products and services, better-informed and equipped consumers, and effective use of products and services. Financial inclusion is not simply about numbers or attracting more clients to the range of providers but should also be "responsible". "Responsible" financial inclusion increases access to financial services in ways that are safe for consumers, enabling their participation informed by knowledge and choice (Staschen and Nelson, 2013; Lauer, 2013). Government (through its policies, regulation, and other support for a stable financial sector) and industry (through standards and guidelines) can promote financial inclusion (Staschen and Nelson, 2013).

Governments, as policy makers, provide frameworks for processes that lead to the promotion of financial inclusion and these policy frameworks also articulate clear operational modalities to achieve national financial inclusion objectives (Ehrbeck, 2012). In addition to putting in place consumer protection regulations, governments can facilitate innovative models for financial inclusion, including promoting ease of entry of new entrepreneurs into the financial sector (Ehrbeck, Pickens, and Tarazi 2012). Instead of providing financial services directly, the role of government's is to maintain macroeconomic stability and provide appropriate regulatory and supervisory frameworks (see Duflos and Imboden 2004).

Staschen and Nelson (2013) posit three barriers to financial inclusion as;

- Supply-side barriers such as transaction costs, the inability to track an individual's financial history, and lack of knowledge about how to serve

    poorer customers

- Demand-side barriers that constrain access to financial services and products. These barriers include socioeconomic and cultural factors, and lack of functional financial literacy (AFI 2010)
- Poor regulatory frameworks, including consumer protection mechanisms that hinder the quantity and quality of financial products and services.

Government can put in place financial inclusion strategies. According to CGAP (2010) and Porter (2011) a financial inclusion strategy clearly defines and aligns a shared vision among policy makers and other stakeholders and it also raises awareness of and secures commitment to sound practices and establishes the means for communication and coordination. Strategies typically include a diagnostic of the current state of the sector to ensure "evidence-based policy making," policy objectives, strategies, and an action plan for implementation (Duflos and Glisovic-Mézières 2008). The action plan for implementation needs to consider all elements of the financial market system: the core (clients and providers and the products they exchange) and the rules (formal and informal) and supporting functions (infrastructure, funding, and information) (Staschen and Nelson, 2013). National strategies that focus on *responsible* financial inclusion, as opposed to simply *access* to finance, might lead to significantly greater benefits for households and service providers alike (Staschen and Nelson, 2013).

Financial capabilities can be raised through financial inclusion at all levels. In turn the results will manifest themselves in lower risk and improved adoption of new technologies by players in the financial services sector; (Tata and Pearce 2012; McKee, Lahaye, and Koning 2011).

Standards of practice and codes of conduct that financial service providers and other market actors abide by can contribute to financial inclusion. Multilateral organizations have provided guidelines such as, "United Nations Principles for Investors in Inclusive Finance," the "World Bank Draft

Guidelines for Consumer Financial Protection," and the "Organization for Economic Co-operation and Development (OECD) Principles and Good Practices for Financial Awareness and Education" (Staschen and Nelson, 2013). CGAP has developed numerous guidelines for the industry based on consensus from various stakeholders, including, for example, "Microfinance Investment Vehicle Disclosure Guidelines"; "Good Practice Guidelines for Funders of Microfinance"; "Regulation and Supervision Consensus Guidelines"; "Information Systems Implementation Guidelines"; "Disclosure Guidelines for Financial Reporting by Microfinance Institutions"; "The Role of Funders in Responsible Finance"; "Due Diligence Guidelines for the Review of Microcredit Loan Portfolios"; "Developing Deposit Services for the Poor"; and "Definitions of Selected Financial Terms, Ratios, and Adjustments for Microfinance." (See www.CGAP.org)

Potential barriers to effective consumer protection through Standards and guidelines include, for clients; lack of product knowledge and financial literacy and for financial institutions; vested interest in product-specific marketing than in education that will enable customers to compare products across lenders (Nelson, 2009).

2.6. Rural finance; a historical perspective

2.6.1. 1950-1970s

Literature reveals that approaches to agricultural financing for poor smallholder farmers has evolved over time as a result of the improved understanding of the underlying challenges. Beginning in the 1960s, subsidized agricultural credit programs were popularized as a way to correct the market failures thought to be the cause for the small amount of credit allocated to agriculture (Meyer, 2015, Robinson, 2001, Barry 2003). These programs usually imposed a rather naïve supply-leading approach of interest rate ceilings that undermined the health of the mostly government financial institutions delivering credit (CGAP, 2004). In most African countries it has

been documented that governments, in the quest to address poverty and food insecurity as top priorities, have always intervened in agricultural markets, including in finance (CGAP, 2004; Meyer 2011; Meyer 2015). For the same purpose international development partners, such as the World Bank, AFD, EIB, AfDB, ADB, KfW, and IFAD, provided credit lines to national central banks or ministries of finance, which in turn refinanced local banks at concessionary interest rates (Jessop et. al 2012). This approach was largely declared a failure, including by Adams et al. (1984), in their work 'Undermining Rural Development with Cheap Credit', which is a widely cited critique of this credit led approach.

The interest rate research continued into the 1960s. Important publications by Bottomley, (1963a; 1963b; 1964a; 1964b; 1964c) attempted a list of the component costs that determine interest rates, including administration and opportunity costs, risk, and monopoly profit. Despite Bottomley's identification of monopoly profit among rural moneylenders the formal banking system seemed not to take advantage of monopoly profit to service rural smallholder farmers: Amogu (1956) published a discussion of this in the Nigerian context. Gamba (1958) argued that the only means to ensure that poverty could be tackled in Asia was for capital investment to be facilitated through local savings or foreign assistance. His argument was on the basis of research in Malaya on links between savings, poverty and capital formation. The response of governments and donors was to replace the moneylender through the provision of formal credit facilities via banks and co-operatives (Dallimore, 2013).

2.6.2. 1980s &90s

A new school of thought brought about the financial systems paradigm, which was more holistic and inclusive of financial institutions, markets and instruments, the legal and regulatory environment, and financial norms and behaviour (Delancey, 1978; Thomas, 1991; Mayer, 2015). These developments happened when the concept of microfinance was being

adopted. Microfinance supplied small, high interest rate loans to the poor who were financially excluded by the formal banking system because they lacked collateral security (Meyer, 2015).

Microfinance's target clientele was the poor, including women and youths, often referred to as the bottom of the pyramid (Mumbi *et al*, 2008). MFI loan access by the poor was considered a positive initiation into the financial services sector and that with time the poor would eventually qualify to participate and access formal financial services (Meyer, 2015). Scholars however questioned the notion of microcredit as a panacea to poverty alleviation and in-depth impact studies began to question this school of thought. (IFC, 2012; Karlan & Zinman, 2007; Ledgerwood, 2013; Barnerjee, 2015). Many of these studies have been criticized for using weak methodologies that produce biased results. Studies using a more rigorous random control trial methodology have produced mixed results regarding the claim that microfinance makes a major contribution to poverty reduction. Banerjee et al. (2015) reported the most recent example. These results plus earlier studies of agricultural credit cast doubt on the impact of providing large amounts of credit unless other constraints are also reduced (Adams & Graham, 1984; Von Pischke, 1991). However, a major limitation of rigorous random controls is that they usually focus on short-term results and so cannot capture the potential positive effects of long-term access to improved finance (Meyer, 2015).

2.6.3. 21st Century: Financial Systems Approach

The financial systems approach came as an improvement on the poverty reduction approach (Christen and Drake, 2001; Robinson, 1997; Vogel and Adams, 1997). The foundation of financial systems approach was set by the Bank Rakyat Indonesia when it proved that its model of sustainable micro-banking system operated profitably at a large scale without subsidy (Robinson, 2001)

The financial systems paradigm was popularized in the early 1990s and

became widely accepted by the donor community by the mid-1990s (Steel and Charitonenko, 2003). The financial systems approach is based on the principle that a commercial approach is most likely to reach large numbers of clients on a sustained basis (Christen, 1995; Otero and Rhyne, 1994).

Government has a facilitator role in establishing a conducive policy environment, provision of enabling public infrastructure, and supervisory structures that monitor capital adequacy and lending propriety, investors, rule of law (requiring accessible courts and police) for the rural financial markets, with a limited role in direct interventions (Christen, 1995). As such a financial system contains diverse and interacting players (Roodman, 2013).

2.7. The Rural Financial Markets

The rural economy in developing countries is dependent on agriculture. In a bid to address the challenges of poverty and food insecurity, governments in the developing world have channelled huge sums of money through state owned institutions for on lending to farmers below market interest rates (Steel & Charitonenko, 2003). Directed credit from state-owned banks, interest-rate ceilings, credit-allocation mandates, and other "heavy" forms of intervention characterized most of the 1950s to 1970s in many developing countries (Yaron *et al.,* 1998). However well-intentioned, the negative effects of these policies in terms of discouraging private financial intermediation in rural areas, high arrears with attendant losses in state-owned banks and fiscal drain consequences, and political capture (e.g., high lending volumes in election years) have been thoroughly documented (Adams, Graham, and Von Pischke (1984); Conning and Udry, 2007) This narrow approach has failed; it has stifled the development of rural financial markets and benefited only a small percentage of the rural population (Yaron & Benjamin, 1997). In short, rural financial markets are fragmented and imperfect, have been historically riddled by government intervention leading to financial repression, and then left behind when financial liberalization followed to eliminate repression (see Conning and Udry, 2007)

A more effective approach has been tried since the 80s. In this approach governments have sought to improve the legal environment for financial markets through policy reforms. This has promoted the establishment of sustainable Rural Financial Intermediaries (RFIs) that are capable of serving large numbers of the poor (Yaron & Benjamin 1997)

Financial services essential for agricultural and rural development include deposits, savings mobilisation and credit facilities which are offered by both formal and informal agents (Hannig, 2010). Government plays the important role of facilitating the markets by providing conducive macroeconomic, policy and legal environment in which all agents providing rural financial services operate (GPFI, 2015). Such an environment should foster the easy entry and exit of financial intermediaries and the sustainable growth of rural financial markets (TFC Capital Zimbabwe, 2011)

In developing countries credit supply in rural areas is limited to short-term loans, and does not satisfy the diversified demand and additionally savings services are poorly adapted, unable to compete with traditional forms of savings (like livestock and grain stocks) (Guérin, et al., 2011). Moreover, experiences with agricultural insurance (crop, livestock) are few and far between, and rather unsuccessful (Ibid).

Scholars (Steel and Charitenenko, 2003; Christen and Pearce, 2005) have outlined the country-level constraints that can prevent rural financial markets from operating efficiently as including:

(a) Unsound macroeconomic management; (b) restrictive agricultural or financial policies (particularly interest rate controls); (c) insufficient institutional capacity within rural financial institutions to achieve high levels of outreach in a sustainable manner; (d) underdeveloped legal systems, particularly with respect to marketable property rights, resulting in weak collateralization of claims and inadequate contract enforcement mechanisms; (e) inadequate prudential regulation and

supervision of financial intermediaries; and (f) poor governance, corruption, and other political factors that raise risks.

The authors further predicate that in many cases, concessional, directed credit and bailouts of state-owned, agricultural credit institutions have "crowded out" private, for-profit rural financial institutions from establishing themselves.

2.7.1. Informal Finance

Ledgerwood, (1999) categorised informal providers as those to which neither special bank law nor general commercial law applies, and whose operations are also informal so that disputes arising from contract within them often cannot be settled by recourse to the legal system. Chandavakar (1998) defined informal finance as the totality of legal financial activities and transactions which are not, however, recorded and regulated and which fall outside the sphere of official financial institutions. Their financial transactions are generally not subject to control by the country's key monetary and financial policy instruments (World Bank, 1994). The formal and informal systems can be considered as two sides of a financial continuum, and the middle segment of the continuum can by classified as the semi-formal (Ghate, 1992).

Credit Unions and cooperatives are classified in some literature as "semi formal" intermediaries (Ledgerwood, 2013). They however can be classified as part of the "informal" financial system.

When credit is not available on time and at reasonable rates from institutional (formal) sources, farmers resort to non-institutional (informal) lenders (Reddy, 2012; Chaudhuri & Gupta, 1996). The informal financial sector comprises of heterogeneous entities; individuals, institutions and groups- including moneylenders, traders, stockists, food processors, friends, relatives and neighbours (World Bank, 1994). The same publication further gives the reasons for the popularity of informal lending as

i) ease of obtaining loans, simplicity of procedure, convenience and personal attention, confidentiality and timeliness ii) low transaction cost in terms of time and money, and low interest rate (some times at 0%) except for professional moneylenders. Iii) Facilities are closer to home iv) personal guarantee is acceptable as collateral and v) ease of exit and entry vi) the borrower has the freedom to use the borrowed funds for whatever purpose.

The informal sector often succeeds where formal sector does not succeed in reaching clients, offering them a service package that meets specific needs and achieving a reasonable repayment rate (Maylie, 2015).

Leora & Doroter, (2015) explain that several features characterise the informal sector including predominance of cash transactions, the absence of record-keeping and regulation, the restricted scale of transactions, the ease of entry and exit, the convenient exchange of assets outside the legal framework, and a mode of operation which relies on personal relationships or interdependence within communities, of individuals and groups. Informal credit is often scarce, available in small amounts, and for short periods, it is sometimes very expensive but may carry no interest at all when transacted among family members, neighbours and friends (Bouman & Houtman, 1998). Transactions are generally unrecorded and without collateral, and are based almost purely on promise and faith (Karunagoda, 2007). Personal knowledge of the borrower is what lenders rely on. Studies have shown that the aggregate volume of informal credit far outweighs that of formal finance (Maylie, 2015). By creating a macro-economic environment and a legal framework conducive to the continued growth of the informal financial sector and its co-existence with the formal financial sector, it is possible to foster competition in rural financial markets (Nelson, 2013).

Bouman and Houtman (1988), summarise the appropriateness of the informal sector to rural societies thus: Informal lending has a number of favourable features, in keeping with the environment, they operate without costly

buildings, staff and paper work; because of proximity, they have knowledge of the credit-worthiness of borrowers, which minimises the cost of assembling information; they are accessible at all times and keep procedures simple to reduce transaction costs; they supply saving facilities, offer and accept payment in cash and in kind, and are flexible in rescheduling loans. Superior local intelligence and possibility of applying social pressure and exercising extra-legal forms of sanctions enable them to collect debt in a timely manner (Bouman & Hautman, 1988). The cost of processing and recovering loans are much lower and the simplicity of procedures reduces transaction costs for the borrowers and lenders in addition credit from the organisations is more accessible than formal credit (Allan, et al., 2013).

Commonly quoted examples of informal arrangements in rural finance, such as savings clubs, and Rotating Savings and Credit Associations may not be very relevant to the requirements of agricultural production, particularly for investment (Nelson, 2013). There is however exceptions such as the women's savings clubs in Zimbabwe, where group savings are used for bulk purchases of farm inputs (Chimedza, 2006). Private traders who lend directly to individual farmers also provide informal credit.

2.7.2. Formal Finance

Ledgerwood (2013) define formal institutions as those that are subject not only to general laws and regulations but also to specific banking regulation and supervision. The formal financial system includes institutions, which accept deposits from the public and operate savings and similar schemes. These include post offices, insurance companies, building societies, finance houses, commercial banks, savings banks, investment banks, merchant banks, cooperative banks and development banks (Kendal, 2010).

Government and aid agencies have been active since the 1950 in establishing and supporting development banks (World Bank, 1994). These Development Finance Institutions (DFIs) specialised in investment and operations, which

could not meet the common "business" or "commercial" criteria of existing financial institutions (World Bank, 1994). State owned DFIs were created to meet special financial needs of enterprises that conventional banks could not provide . The operations of DFIs have been heavily subsidised because they rely mainly on government and other external funds and contend with low loan repayment rates and low liquidity (World Bank, 1994). The role of commercial banks in financing agriculture has been limited because of perceived risk and high transaction costs of administering new and small borrowers' loans. There has been a tendency for commercial banks to concentrate on large customers in urban areas and avoid risk prone rural areas (World Bank, 1997).

Some commercial banks however in a bid to mobilise rural savings have set branches for this limited purpose and for lending mainly to traders in rural centres (Allan, et al, 2013). Commercial banks tend to cluster in urban areas and in certain rural centres, and concentrate on lending commercial and industrial enterprises and large-scale farms while most of the rural areas are underserved (Allan, et al, 2013). Credit to trade is often larger than credit to agriculture and other rural enterprises.

Since commercial banks view lending to rural enterprises as risky and are therefore unattractive at given market interest rates, Governments, in a bid to spur development activities feel justified in setting up Development Financial Institutions (DFIs) (Mondiale, 2008). These DFIs in SSA are either wholly state-owned or indirectly controlled by governments (Yaron et al, 1998). The resources for these DFIs are generally provided directly by government, or indirectly from donor funds at concessional interest rates (Zumbika, 2006). In SSA most DFIs have become illiquid and insolvent because credits to public sector enterprises poorly perform, lack comprehensive policy, regulatory and institutional framework, have over extended branch networks due to government/political pressure, operate mandated interest rates on savings and loans, have weak banking management and accumulate non-performing loans and loan losses (Yaron, Benjamin, et al, 1998).

Formal finance institutions have not always been very successful in serving the rural farmers. Evidence available suggest that less than 10% of rural households and enterprises in SSA countries have access to formal institutions for their credit needs (Zumbika, 2006). Large chunks of the rural population rely on cooperatives and credit unions and a variety of other informal groupings such as ROSCAS and other informal sources of their financing (Pearce and Helms, 2001).

Formal financial institutions concentrate their lending in urban areas while informal operate both in urban and rural areas

2.7.3. Government Involvement

Government help to increase the willingness of lenders to provide long-term finance by providing a conducive economic environment, modernising legal systems and making contracts more easily enforceable, clarifying property rights and improving title transfer and loan security, improving bank regulation and supervision, trading accountants and auditors, ensuring the adequate disclosure of information and improving infrastructure (World Bank, 1997). Government seek to ensure that resources are allocated according to national development strategies (World Bank 1997).

2.7.4. Rural Credit

While some studies in literature find the direct and significant impact of agriculture credit on output (Bashir et al., 2010; Saleem & jan, 2011; Rima, 2014; Villanueva, 2014; Ekwere & Edem, 2014), other studies, however, differ and say that there is no direct impact of agricultural credit on farm output (Sriram, 2007; Hussain, 2012; Zuberi, 1989; Sjah et al., 2003).

Credit is often considered to be a key element in the modernisation of agricultural and other rural sector investments and operations (Yadav and Sharma, 2015). Credit also accelerates adoption of new technologies. Many SSA countries have undertaken targeted credit programs to support rural

activities on the premise that credit is an integral part of the process of commercialisation of the rural economy and a vital instrument of economic development (Mondiale, 2008). The justifications for directed credit schemes have included support for weak economic groups, need to support priority sectors or activities, infant industries and avoid or recover from market failure (Kendall, 2010). For agriculture, the main reasons for advocating government intervention, through targeted and subsidised credit, in support of agriculture are that; agriculture financing is the most risky venture, shunned by profit oriented private banks; agriculture is at the mercy of the vagaries of weather and hazards like pests and natural disasters; there are no organised markets for farm produce; farm income drop heavily in years of abundant yields and uneconomical producer prices at harvest time; small-scale operators cannot generally offer collateral or guarantees; it supports the pursuit of government policies like self sufficiency in food, producing industrial raw material, and export crop cultivation and accelerated development of agricultural sector would serve as the motive force in economic development (World Bank, 1994).

Financial markets may transfer subsidies in two ways, through concessionary interest rates, including cross-subsidisation and subvention payments made by governments towards the operational costs of intermediaries, and through loan defaults which too might in the end be reimbursed or condoned by governments (Kendal, 2010). Subsidy has the effect of crowding out other sectors out of the market (Miller, 2013). Once credit programs are begun, they create a consistency of beneficiaries who do not want them to be stopped and it becomes difficult for governments to reduce its support for such programs, regardless of changed circumstances, high cost, inefficiency and abuse, for example. (Miller, 2013). Many directed credit have resulted in the mounting of non-performing loan portfolios and the eventual demise of the lending institutions (Akpan, *et al*, 2013)

The World Bank Reviews (Besley, 1994; Khandker 1998; Kendal 2010) of SSA countries reveal serious system problems with some systems barely performing any intermediation functions. The lack of adequate emphasis on institution building in rural financial market development is a common failing in supply-led credit schemes (Yuan et al., 2011). Too few resources are devoted to appropriate and adequate training, efficient and meaningful managerial information systems, staff incentives systems and the promotion of savings mobilisation (World Bank, 1997).

Studies have been done to determine the factors that influence the farmers' choice where they can get agricultural loans (Akpan et al., 2013; Salami & Arawomo, 2013; Yuan et al., 2011). Several variables have been used in literature to analyse these variables' impact on farmers' decisions (Yadav & Sharma, 2015).

2.7.5 Limits to Replicability of Successful Models

The Grameen Bank in Bangladesh is often quoted as a successful example of providing credit to the poor, achieving excellent loan recovery performance without jeopardising the financial strength of the lending institution, and yet reaching out to very poor people in Bangladesh (Khandker, 1998; Karmakar, 1999; Robinson, 2001; Armendariz de Aghion and Morduch, 2005; Menon, 2006) Working through the small "groups" and "centres" is one of the major innovations of the Grameen Bank. Despite its success in reaching the poor, it has two main weaknesses: its operations costs are very high and it lacks its own resources (Menon, 2006). It is heavily reliant on external donor sources for its lending resources (Robinson, 2001). The success of the Grameen Bank is also attributed to the individual capacities of its chief architect Prof. Yunus. Such individual traits may militate against the replicability of the Grameen Bank model.

2.7.6. Savings

Ledgerwood (2013) posits that savings mobilisation improves resource allocation by drawing funds away from less productive purposes and allocating the resources to more productive uses. While savings are needed by all households for smoothing income and consumption flows, they are especially vital for the farming households who, being excluded from the formal credit markets, they need savings to mitigate risk and make productive investments in their farms (Qadir, 2005). Qadir (2005) also posit that rural farmers invest their savings largely in livestock in that livestock can be bought and sold when needed and is a good livelihood diversification strategy for low-income households. The author further posits that livestock such as cattle and goats can provide milk, which provides nutrition security and reduces over reliance on crop products whose availability is limited by their seasonality. Farmers also save by immediately buying the agricultural inputs for the next season after marketing their crop yields (Rutherford, 2000).

Lending rates kept deliberately below market level under government programs tend to discourage savings (Udry, 1990). They also tend to discourage lenders from mobilising savings because they cannot lend these funds at remunerative rates, as they have to pay market rates to attract savings (Udry, 1990, Idoge 2013).

A study by Ike and Umuedafe (2013) revealed that many of the rural farmers are faced with the problem of lack of access to credit or loan and this has a significant impact as a constraint to savings. The author further points out that the inadequate access to credit reduces what the rural farmers can produce and this in turn affects what they can save. The study also established that low productivity of agricultural produce is also a major factor, which inhibits the farmers' ability to save and accumulate capital.

Rural households have a high propensity to save, prompted particularly by insecure economic conditions that generally prevail in rural settings

(Dallimore, 2013). There is ample evidence that rural smallholders in SSA countries, do in fact, save in real money forms and surveys conducted in Malawi and Ghana show that households, as groups, save more than they can invest (Dallimore, 2013; Thillairajah, 1994). The rural poor more than anyone else, must have a liquid reserve to meet emergencies and credit, usually from informal sources that can sometimes supplement this liquid reserve (Thillairajah, 1994).

Dallimore (2013) argues that agricultural economic activities generally yield low returns and are high risk in nature and that in such environs; member-owned institutions (MOIs) are often the most suitable and sometimes only form of financial service delivery. The author further advances that this informal financing mechanism is community-based and founded on a 'savings first' model, given that often the only capital available is that raised by members themselves.

2.7.7. Interest, Costs and Risks

2.7.7.1. Interest rates

In the credit market, interest is paid by the borrower to the lender to encourage the creditor to forgo his potential command over current output and future investment possibilities (Nwachuku, 1994). Interest rate also covers the costs incurred in administering and supervising the loan (Nwaru, Onyenweaku, & Nwagbo, 2005). The costs of credit, administration costs, duration and collection costs should be reflected in the interest rate (German Foundation for International Development, 1986). In a review of empirical studies, Desai and Mellor (1993) indicated that 50% of the studies showed that credit demand is highly elastic to the real interest rate.

From the 1960s to the 1980s, governments tried to address food security problems by implementing top-down subsidized and directed agricultural credit programs. (Meyer R. L., 2014). Interventions were often considered necessary to induce commercial lenders to supply credit for farmers at

artificially low interest rates to accelerate adoption (Ibid). This paradigm failed because although increases in lending contributed to some short-term increases in food supplies it did not lead to sustainable credit supplies (Meyer, 2014). Low interest rates crowded out commercial banks and stimulated excess demand for loans and induced credit rationing that tended to favour richer and politically powerful farmers (Vogel R. C., 2005; Gonzalez, 1984). Cheap credit policies force intermediaries to pay low rates on financial deposits. This has a twofold effect on savers- they receive a lower rate of return than they would if higher rates were paid, and intermediaries usually offer fewer deposit services (Adams, 2015)

Hareth (1996) posits that adverse selection and moral hazard are not independent of the interest rate charged; high interest rates increase adverse selection and moral hazard for at least two reasons. First, potential borrowers will need to have available investment opportunities yielding high return in order to justify higher loan costs, but investments with high-expected returns are usually more risky than less rewarding opportunities. Secondly the higher the cost of finance, the greater the incentive for borrowers to choose to default.

Herath (1996) further suggests that, because raising interest rates increases risks for lenders through greater adverse selection and moral hazard, total revenue to the lender will at first rise with increase in interest rates, but at a declining rate as the default rate also rises. There will be an interest rate at which the lenders' revenue is maximised, known as the bank-optimal rate. A rational lender will not wish to raise the interest rate above this level. The consequence may be that, if the demand for credit is strong, interest rate may not serve as an equilibrating price to bring the supply and demand into alignment. In their empirical study Nwaru et al., (2005), posited that interest rate is the most important factor in the credit market and indicated that interest rate elasticity of credit demand is fairly elastic and that for credit supply it is inelastic. As such for efficient rural credit markets interest rate policies should

make for optimal credit provisioning and at the same time, minimise the risk composition of the lenders' portfolio (Nwaru et al, 2005)

2.7.7.2. Transaction costs

Transaction costs include money costs, incurred administrative costs and opportunity costs in terms of time and lost opportunities suffered by depositors, savers, intermediaries and borrowers (Allen 2006). These include money and time spent in information gathering, formalising collateral arrangements, document processing, approvals, disbursements, and collections and establishing relationships (Ramstad, 1986). Depositors of savings and institutions that mobilise savings incur transaction costs, including the opportunity cost of time of travel and waiting time to deposit savings (North, 1992). Similar costs are incurred related to the withdrawal of funds, inconvenient bank hours and the bureaucratic procedures often adopted by formal institutions (Schlag, 1989). For the financial intermediary there are cots involved in deposit mobilisation, maintaining branches, operating mobile units, facilitation of the mobilisation and withdrawal of savings, customer account administration and control procedures (North, 1992).

Lenders transaction costs consisting of appraisal, administering, monitoring and enforcing loans are relevant in interest rate determination (Barry and Robison, 2001). A critical issue related to savings mobilisation and lending to the poor households is the high transaction costs. For instance, Mittendorf (1987) reports an example, that in 1985, the transaction costs incurred by the lender to a fertiliser credit project in an African country were reported to be about 62% against an interest rate of 10% charged to farmers. Transaction costs in credit schemes make fertiliser very costly in economic terms.

In agriculture, credit transactions are hampered by small loan sizes, lack of assets that are suitable as collateral, and covariate risks (Pertrick & Latruffe, 2005). These factors increase the costs of lending to farm enterprises and

may even result in complete unavailability of loans to certain farmers (Barry and Robison, 2001)

Cheap credit programmes increase transaction costs in the market, fragment the rural market even more in formal and informal segments and by increasing transaction costs decrease the number of transactions taking place (Von Pischke, 1991). Therefore it decreases access to financial services for the majority of rural people.

Transaction costs are also increased by constraints that include shortage of infrastructure including transport facilities, lack of communication facilities, lack of farmer support services in general and poor flows of information (Nelson 2013). Low productivity of agriculture and lack of positive returns on investment opportunity increase the default rate of borrowers, as well as transaction costs (Barry and Robison, 2001).

2.7.7.3. Risks

Maurer (2014) makes a distinction between risks in agriculture and risks in agricultural finance. The former is concerned with risks of agricultural production and marketing from the perspective of the farmer (real sector view) and the latter is concerned with risks of lending to farmers from the viewpoint of a financial institution (financial sector view). Five major sources of risk in agriculture can be defined (See OECD 2009):

1. Production risk concerns variations in crop yields and in livestock production due to weather conditions, diseases, and pests;
2. Market risk is related to the variations in commodity prices and quantities that can be marketed;
3. Financial risk relates to the ability to pay bills when due, to

have money to continue farming, and to avoid bankruptcy;

4. Legal and environmental risk concerns the possibility of lawsuits initiated by other businesses or individuals, and changes in government regulation related to environment;

5. Human resources risk concerns the possibility that family or employees will not be available to provide labour or management to the farming business.

There are three types of risks that affect agriculture finance; principal risk, specific risks and political risks (Maurer, 2013). The principal risks in agricultural finance comprise common risks associated with the viability of the farm business and the farmer's character and farm businesses are exposed to specific production and market risks that may affect their repayment capacity. There are also political risks to agricultural lending institutions since political interventions often turn out to be detrimental to lending to farmers (Ibid).

Maurer (2013) further posit that principal risk is explained by high degree of informality, lack of separation between household and enterprise activities, lack of records and financial statements, lack of collateral for loans, asymmetric information leading to moral hazard and adverse selection, poor legal frameworks and poor state of the physical infrastructure including roads, electricity and telecommunication.

Specific risks comprise production risks, market and price risks and political risks (Maurer, 2014) Production risks arise because farmers cannot predict with certainty the amount of output their production process will yield, because of external factors such as weather, pests, diseases (Christen and Pearce 2005; OECD, 2009). Both input and output price volatility are sources of market risk in agriculture (Christen and Pearce, 2005; World Bank, 2005; Rettburg, 2010)

OECD (2009) explains the existence of production and market risks at different levels and scale. At the micro level risks affect a single farm

household only, e.g. hail or fire. At the intermediate meso level risks affect groups of farm households or communities in certain areas, e.g. floods or landslides and at the macro level affect entire regions and countries eg hurricanes and droughts

Political risks arise as a result of the fact that agriculture is the backbone of developing countries resulting in a lot of government interference hence these political interventions constitute a major political risk for financial institutions engaged in agricultural lending (OECD, 2009).

Maurer (2014) concludes that agricultural finance comprises more than just credit. Farm households need money transfer and payment services and, most importantly, savings facilities. Savings have always been an important aspect of sustainable agricultural financial service provision.

The World Bank (2005) explains that principal, specific and political risks in rural and agricultural finance are managed through several approaches. For principal risks the options are asset-backed lending mainly focuses on collateral security, expert-based appraisal of repayment capacity, portfolio management using exposure limits and diversification, building risk reserves through loan loss provisioning and contractual arrangements. For specific risk, approaches include segmenting risk into different layers in order to match each set of risks with different "buyers" of risk, (World Bank, 2005). These layers can be defined along a set of risk characteristics: (1) the level of risk (micro, meso, macro); (2) the degree of correlation (idiosyncratic, covariant, systemic); (3) the probability of occurrence (frequent, less frequent, seldom); and (4) the magnitude of the losses (low, medium, high) (See Maurer, 2014)

The first layer refers to losses that happen at the individual farmer level (micro level). Examples include small weather shocks such as hail. The farmer can manage this type of risk at the farm, household or community level. This is "normal risk" or risk retention layer. The second layer corresponds to risks that are more significant and less frequent at the meso layer, affecting groups of

farmers or communities, for example floods. Farmers can use market solutions such as insurance. The third layer (macro level) comprises risks that generate huge losses on a wider scale, for example, widespread drought. Government, and international development partners assistance is important in these catastrophic national or regional disasters. This is the market failure layer (Maurer, 2014; Hartig et al., 2014; World Bank, 2005; Levin and OECD 2009)

High transaction costs are associated with insurance markets due to information asymmetries, and the resulting problems of moral hazard and adverse selection, and with distribution and administration of insurance services for small-scale insurance contracts with farmers in remote villages (World Bank 2005). For these reasons it is difficult to provide traditional agricultural insurance for small farmers. Farmers cannot afford the high insurance premiums and resort to relatively cheaper alternative strategies such as diversification and farmer coping mechanisms (OECD, 2009). Small and marginal farmers are, therefore, excluded from agricultural insurance services.

Group lending has been widely documented as an approach that reduces risks (Evaristus et al, 2004; Al-Azzam, 2006). The approach nonetheless may lead to financial exclusion of the core poor who remain "group-less" after being discriminated during group formation (Adewale et al., 2012).

2.8. Gaps in Rural Financial Intermediation

Chaia et al. (2009) using different data sources estimated that about 80% of households in Sub-Saharan Africa were financially excluded in the early 2000. Kendall et al., (2010) obtained similar results using more recent data. While developing countries have only 28% as many bank accounts per adult as do developed countries, the figure in Sub-Saharan Africa is far lower (only 16%) (Dupas et al., 2012). Lack of access is particularly acute in rural areas:

representative household survey data collected between 2009 and 2011 suggest that only between 15 and 21 per cent of households are banked in rural areas of Kenya and Uganda, respectively (Dupas et al., 2012)

Gonzales-Vega (2003) identifies three gaps exist that together characterize the overall gap in rural financial intermediation; the **inefficiency gap, the insufficiency gap and the feasibility gap.** Each of these gaps explains the specific ways in which supply of rural financial services is insufficient and that each of the gaps require different types of interventions to address them.

The author explains that the **inefficiency gap** separates the current state of rural financial deepening situation and potential supply of financial services, where **Potential supply** is the amount (volume, number, type) of financial services that could be provided, given current factor endowments, institutional infrastructure, and financial technologies. To close this gap, it will be necessary to change policies and to introduce compatible incentives that would allow increases in efficiency, to promote a movement from the current rural financial deepening situation towards the frontier of what is potentially feasible.

Gonzales-Vega (2003) explains that the **insufficiency gap** separates potential supply and **effective demand** for rural financial services. To close this gap will require additional innovations in financial technologies, the accumulation of various types of specific capital –particularly specialized human and information capital– as well as further development of the physical and institutional infrastructure needed for a more efficient and smooth operation of rural financial markets.

The **feasibility gap** separates legitimate demand from unrealistic political expectations or promises. The gap results from political pledges of outcomes that are not achievable in terms of desirability, degree of difficulty and costs.

At any point in time, therefore, potential supply of financial services can be

represented by a **frontier of production possibilities** of financial services (PPF). As illustrated by Gonzalez-Vega 2003, the frontier shown in figure 2-1 represents potential combinations in the production of two types of financial services –urban and rural. Amounts of urban financial services are shown on the vertical axis and amounts of rural financial services are shown on the horizontal axis. Combinations "a" and "b" of these two types of services are feasible, while combination "c" is not feasible, under current circumstances. Moreover, combination "b", which is right on the frontier, indicates the achievement of **technical efficiency**. Given this combination, it is no longer possible to produce more rural financial services without reducing the amount of urban financial services produced or vice versa. Below the frontier, it would still be possible to produce more of both types of services. The existence of an inefficiency gap is represented by a current combination of urban and rural financial services produced at a point such as "a", which is below –inside– the frontier in figure 2-1.
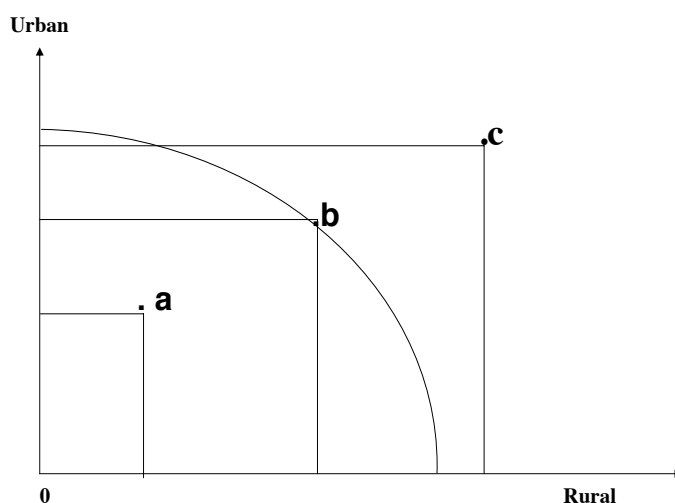
Figure 2-1 Production Possibility Frontier for Financial Services.

Source Adapted from Gonzalez-Vega 2003

Gonzalez-Vega (2003) identifies three principal sources of inefficiency. First,

resulting from incorrect government **policies**, such as those adopted during the protectionist-repression period. Second, from the channelling of public resources and funds through weak and unsustainable rural financial **institutions**, which cannot productively use them and third, from the absence of appropriate structures of **incentives** within rural financial organizations.

The insufficiency gap is closed when there are outward shifts of the frontier. Three different processes can cause a biased expansion of the frontier that favours rural financial deepening: (a) **innovations** in financial technologies that overcome typical obstacles to rural financial transactions and the design of new financial products that respond to the characteristics of rural household-firms, (b) development of the physical and institutional **infrastructure** that facilitates adoption of the new financial technologies, and (c) **human capital** formation that facilitates adoption and implementation of the new technologies

Reasons behind the financial exclusion of the rural poor can be generally categorized into the supply-side and demand side factors (Datta, 2004; Adewale et al., 2012;)

2.9. Supply Side Factors

The rural poor are often misconstrued as a homogenous group with the same socio-economic characteristics and needs (Adewale et al., 2012). This results in deficiencies in targeting resulting in certain categories of intended beneficiaries being left out in microfinance programs. Those mostly left out are the elderly, disabled, ill health, and women headed households (Solomon et al., 2002; Copestake et al., 2002).

Lack of infrastructural facilities like good roads, healthcare, electricity and security influence the choice of location of the financial institutions (Porter, 2003; Dunford, 2006)

Beck and De la Torre (2006) pointed out the effect of transaction costs on the

supply of financial services to the poor on three different levels.

> First; at the client level, the cost of processing small loans may not make it viable to serve the poor. Second; the fixed expenses and costs on fixed assets, accounting systems, security arrangement, computers does not permit spreading of fixed costs on the small value transactions of the poor. Finally, the financial institutions would have to comply statutory requirements, including, inter alia, the minimum paid up capital requirements, incorporation fees, clearing and settlement fees.

2.10. Demand Side Factors

A convincing explanation of why and how the poor and low-income households demand basic financial services is by Rutherford (2000). His explanation is based on the main assumption that the poor need "lump sum" or "large sum" money at a certain point in time. Rutherford (2000) sees three processes namely saving up, saving down and saving through:

> *Saving up* implies a series of savings from now in exchange for a large sum needed in the future.

> *Saving down* implies a series of savings in the future in exchange for a large sum used today, normally regarded as a loan.

> *Saving through* implies the combination of the two above processes. Specifically, if the saving up process generates insufficient amount when needed, a further loan may be taken and then repaid by the next savings.
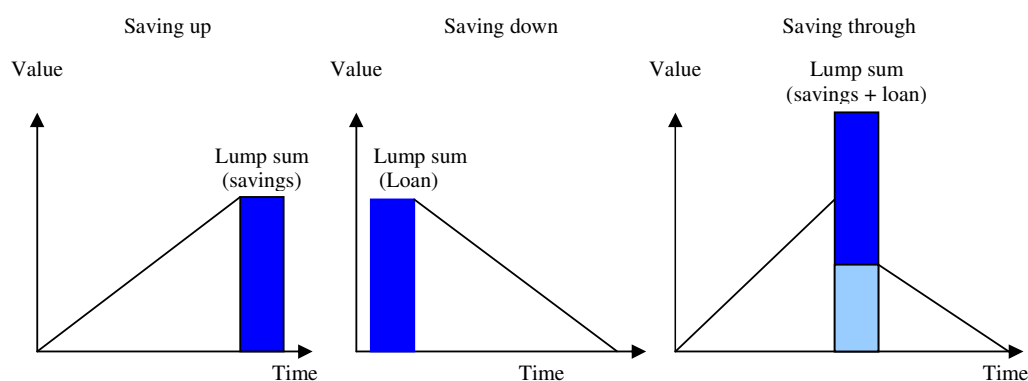
Figure 2-2: Borrowing and Saving in lump sum money model

Source: Adapted from Hao (2005)

Hence, Rutherford (2000) shows that the poor and low-income households do save and borrow to acquire the lump sums for various needs such as emergencies and investment in agriculture. The poor therefore have the demand for basic financial services.

The reasons for financial exclusion may lie on the demand side whereby farmers demonstrate phobia for debt (Adewale, 2006). Datta (2004) provided evidence supporting that women headed households and the number of working adults in a family influence whether or not the poor will avail themselves of credit opportunities. The poor may not demand credit because it is priced beyond their reach by microfinance institutions (Demirguc-Kunt et al, 2008).

Gibbons and Meehan (2002) show that of about 234.9 millions poor households around the world, there are only around 19.6 millions households having access to financial services, making only 8.3% coverage ratio. The low coverage ratio means more needs to be done in order to improve financial inclusion.

2.11. Financial Access, Participation And Credit Rationing In Rural Financial Markets

2.11.1 Asymmetric Information, Adverse Selection and Moral Hazard

Key concepts of the imperfect information paradigm as applied to credit markets include asymmetric information, adverse selection, moral hazard, and credit rationing (Weng, 2008). *Asymmetric information* is a situation when one party (usually the borrower) to a transaction has more information about the transaction than the other (usually the lender); such unequal information can lead to adverse selection. As defined by Weng (2008), *adverse selection* occurs when lenders cannot distinguish between borrowers of different degrees of risk. An increase in the interest rate will cause borrowers with less risky projects to withdraw from the credit market and therefore increase the average riskiness of the applicant pool. A lender may thus be better off rationing access to credit at a lower interest rate rather than raising the interest rate further.

Moral hazard, a concept due to Arrow (1963), refers to the possibility that the redistribution of risk (such as insurance which transfers risk from the insured to the insurer) changes people's behaviour (Besley,1994). *Moral Hazard* arises when lenders are unable to discern borrowers' actions that would affect the distribution of returns from an investment (Arrow, 1963). Stiglitz-Weiss (1981) proposed a model whose underlying assumption is the limited liability for the borrowers. If the borrower's project fails and the loan is not repaid, the lender bears the cost of the loan. This encourages the lender to increase the interest rate. However, Stiglitz and Weiss (1981) showed that an increase in interest rates would reduce borrowers' incentive to take the effort to avoid high risk projects and the probability of loan repayment is thus reduced. As with adverse selection, lenders would restrict the loan amount in order to correct borrowers' incentives (Besley, 1994). The poor development of property rights in developing countries makes it difficult to enforce the repayment of loans

when borrowers are able but unwilling to repay. This again causes the lenders to reduce the amount of loans.

Weng, (2008) established that households decide to apply for a loan after the comparison of utility of borrowing and the reservation utility of self-finance. However, the high transaction cost of a loan application and low probability of obtaining a loan reduces the utility of borrowing. Thus, households might select himself out of the credit market in the face of the disutility of transaction costs and the fear of rejection. The observed low participation in formal credit markets might not be the result of rationing by lenders; rather it might the consequence of the low demand for credit by borrowers due to inefficiency in agricultural production or less costly credit being available in the informal credit market.

Stiglitz and Weiss (1981) developed a model of a competitive banking system in which the formal financial institutions, e.g. banks, are uninformed and the borrowers are the informed. The risk profile of the borrowers—their investment choices, honesty, risk tolerance, capacity and willingness to repay loans, and so on—is unknown to the banks. The authors further explain that as a result of the foregoing, banks may charge higher interest rates to offset the risks caused by asymmetric information. They explain that the higher interest rates increase the returns to successful loans; the average riskiness of loan applicants may increase because low-risk borrowers may choose not to borrow at the higher interest rates (the adverse selection effect of interest rates).

Stiglitz and Weiss (1981) further predicate that it is difficult to identify "good borrowers," and to do so requires the bank to use a variety of screening devices. They point out that the interest rate which an individual is willing to pay may act as one such screening device: those who are willing to pay high interest rates may, on average, be worse risks; they are willing to borrow at high interest rates because they perceive their probability of repaying the loan

to be low. As the interest rate rises, the average "riskiness" of those who borrow increases, possibly lowering the bank's profits.

Financial markets are, perhaps the most regulated in many countries. Regulations mainly arise because of the fungibility of money, the traded product in financial markets (Adewale et al, 2012). The principle of safety and profitability, according to Stiglitz and Weiss (1981) limits the ability of price allocation mechanism to ration credit even when financial market is in equilibrium. Equilibrium does not exist at the point where the demand and supply of credit equate because financial institutions must take into account information asymmetry and the resultant adverse selection and moral hazards. Figure 2-3 capture the explanation provided by Stiglitz and Weiss (1981).
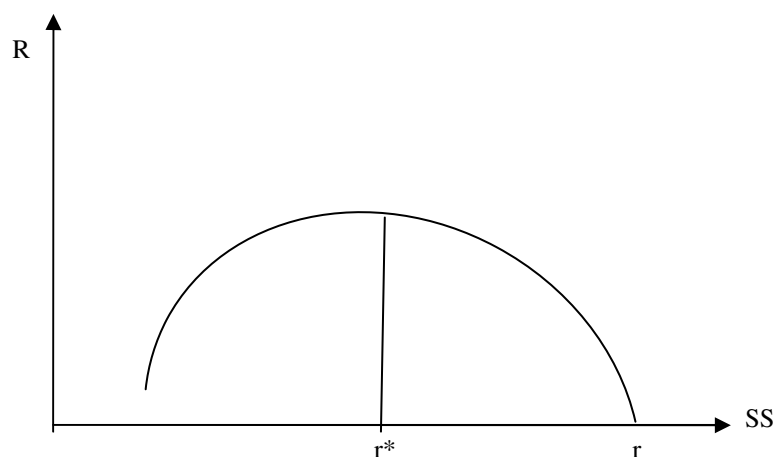
Figure 2-3: Supply of loan curve;

Source: Adapted from Demirguc-Kunt et al. (2008)

In the graph 'R' is the expected return to the bank, while 'r' is the interest rate charges. The bank's supply of loan curve is backward bending, that is, concave down and reaches a maximum at the point where interest rate is r*. At this optimal rate, the bank would not want to raise interest rate (price) even though there is higher demand for credit. This is because as explained by Stieglitz and Weiss (1981), doing so may lead to adverse selection and moral hazard. First, interest rate as a screening device may

discourage risk-averse borrowers with good probability of repayment. Second, it may also attract risk lovers who, though with higher probability of failure do not mind paying the high interest rate. For this latter group of borrowers, there is a high probability of siphoning the credit granted by engaging in risky projects other than that for which the credit was approved. As a result some potential borrowers would be left un-served by the financial institutions. This financial exclusion may be made worse by physical access, affordability and eligibility barriers (Demirguc-kunt et al, 2008).

2.11.2. Credit Rationing

There are three types of credit rationing; risk rationing, price rationing and quantity rationing (Barham et al. 1996; Boucher et al. 2008; Boucher et al. 2009; Carter 1988; Guirkinger and Boucher 2008). The producer determines the first two groups, while quantity-rationed is externally determined by the financial institution (Boucher, Carter and Guirkinger, 2008).

Chiu (2013) explains that, 1) A price rationed farmer may either borrow or not, and is satisfied with the loan amount at the price offered. External price rationing can occur if the lender raises interest rates and/or transaction costs, so that free choice along the credit demand curve results in a utility maximizing position. Internal price rationing occurs when a borrower chooses or not to borrow at fair market prices and transactions costs. Price rationing in this context is determined by cost-quantity trade-offs along the demand curve and the degree by which these trade-offs take place is determined by individual credit demand elasticities, which, as we show later, differ amongst borrowers. 2) Quantity rationed, or supply-side-constrained, farmer may be either an applicant who was rejected a loan or a non-applicant who knew that he would be rejected. A quantity-rationed farmer faces a binding credit limit; therefore, the limiting constraint comes from the supply side. A quantity-rationed farmer is expected to have excess demand. 3) Risk rationed farmers do not face a binding limit and therefore does not have excess demand for credit. The limiting constraint comes from the demand side. Their demand is

lower because of the risk-sharing rules associated with the loan contract. Asset wealth, financial wealth, risk aversion, prudence and property rights are all aspects of the risk rationing problem identified in Boucher, Carter and Guirkinger (2008).

Financial institutions may limit potential borrowers' credit access in what is referred to as quantity rationing. Reasons include policy-induced limits on interest rates and borrowers ' inability to meet the collateral requirement of lenders. **Price rationing** (Transaction cost or interest rate) rationing arises as a result of the cost of obtaining credit in terms of preparing a loan application, evaluating collateral and project viability, and monitoring credit use and repayment. As associated costs are largely independent from the loan amount, transaction cost rationing is likely to be particularly severe for small loans, which are often catered for by informal credit markets that rely on lower cost mechanisms for enforcement. Borrowers may be **risk rationed**, implying that they are unwilling to access credit even if it were available to them because they fear the risk of being indebted and possibly losing the assets pledged as collateral (Barham et al. 1996; Boucher et al. 2008; Boucher et al. 2009; Carter 1988; Guirkinger and Boucher 2008).

Herath, (1996) identifies another form of rationing where the lender requires the borrower to provide collateral before a loan is advanced. This shifts the risk associated with default from lender to borrower to an extent depending on the nature of the collateral and its value relative to the size of the loan. The margin of safety in case of default is determined by the realisable market value of the pledged asset, net of selling costs, relative to the loan amount.

Quantity rationed farmers unwillingly withdraw because they have excess demand for credit that is not met by lenders. Risk rationed farmers voluntarily withdraw. Although they have access to loans that, considering the interest rate, would raise their expected income they however withdraw because the non-interest costs deriving from lenders' strategies to mitigate adverse selection and moral hazard drive their expected utility from borrowing below

their reservation utility (Guirkinger and Bourcher, 2007). Boucher *et al.* (2008) explain risk rationing as existing where insurance markets are absent, and lenders, constrained by asymmetric information, shift so much contractual risk to the borrower that the borrower voluntarily withdraws from the credit market even when he or she has the collateral wealth needed to qualify for a loan contract, as a result, like quantity-rationed individuals, risk-rationed individuals will retreat to lower expected return activities and occupations.
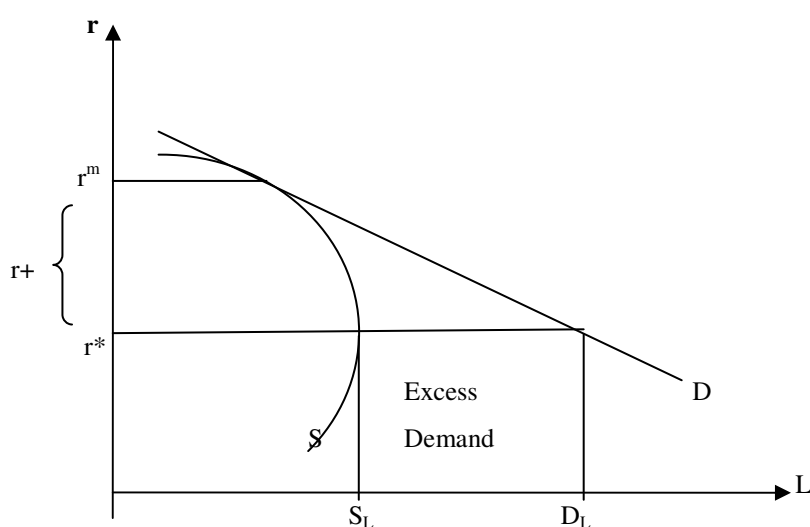
Figure 2-4 Demand and Supply of loan Curves

Source: Adapated from Demirguc-Kunt et al (2008) In: Adewale et al, 2012

Figure 2-4 illustrates the foregoing discussion on credit rationing. Assuming there is no credit rationing and as such, as many people as desire access to funds have unlimited supply by the financial institution. In this case, r^*, the equilibrium interest rate will be raised to r^m. The difference between r^m and r^*, $r+$ is the additional rate of interest that the involuntarily rationed-out borrowers in figure 1 above will be willing to pay as long as they have access to credit. Their subscription to the availability doctrine of finance is discernible. This is because, the financially repressed do not mind having lesser amount of credit even at a higher interest rate r^m than they would at the equilibrium rate of interest, r^* which is lower. High interest rates are never a deterrent to

microfinance clients (Koveos, 2004; Robinson, 2001). Following Stieglitz and Weiss (1981), the safety and profitability principle of financial institutions would discourage them from increasing credit supply even at interest rate, r^m. Hence r^*, the optimal rate of interest would still be the equilibrium price even if the backward bending supply curve S and the downward sloping demand curve intersect at r^m. Equilibrium may not, therefore, hold at the point where loan demand and supply equate.

Furthermore, the excess demand for loan $\mathbf{D_L}$ - $\mathbf{S_L}$ would mean that some eligible and willing borrowers are denied access to finance. According to Demirguc-Kunt *et al.,* (2008), therefore, as long as the effects of moral hazards and adverse selection are difficult to separate, it may even be more difficult to discriminate between access to and intensity of use of finance.

Both voluntary and involuntary financial exclusion may be an indication of the passive dichotomy between access to and use of financial services. Demirguc-Kunt et al (2008) noted that access to finance does not automatically imply use and also that this presupposition is in itself a foundational policy flaw towards financial inclusion. The peculiarity of rural communal farmers in this regard vis- à-vis their lack of collateral and credit history further magnifies their lack of financial citizenship (Adewale et al. 2012).

2.12. Credit Access through Rural Savings And Credit Institutions

In the past, development of financial markets was based on the assumption that rural farmers are too poor to be able to save and lack assets that can be used as collateral for accessing credit (Adams and Graham and 1984; Holt and Ribe, 1991; Von Braun, 1992). Financial services providers considered that savings products were unnecessary (Giehler, 1999). In establishing agricultural credit programmes, with their own or external funds, governments ignored the mobilization of internal savings (Von Braun, 1992). Loans were the main product of agricultural development banks and few were allowed to

mobilize deposits or savings from the general public (Giehler, 1999; Seibel, 2001). Contrary to this belief researchers have indicated that given opportunities and incentives to save, poor people can save far more than previously thought (Adams and Graham, 1984; Otero, 1989; Holt and Ribe, 1991). The informal sector characterised by savings and credit groups in African countries and the successful efforts in the formal sector such as that of the Bangladesh's Grameen Bank imply that it is possible to build rural financial institutions based on the savings potential of the poor (Hossain, 1988; Von Braun, 1992).

Yaron (1995) argued that BRI of Indonesia was successful in savings mobilization because savings were voluntary and not obligatory. Where it suits a credit institution, however, mandatory savings could be made to allow clients to accumulate savings and become eligible for credit. Farmers' savings could be used as collateral and the amount of credit granted could be commensurate of savings deposits.

2.12.1. Member Owned Institutions (MOIs)

Meyer (2014) pointed out that in addition to keeping money in their homes, rural people in SSA save mainly with informal intermediaries. Meyer (2014) further points out that MOIs operate in various forms, including credit cooperatives, credit unions, self-help groups, rotating saving and credit associations (ROSCAs), village-level savings groups or accumulating savings and credit associations (ASCAs) and burial societies. Cooperatives and credit unions are relatively small therefore share of total savings and loan accounts also tends to be small (Christen *et al.*, 2004). MOIs empower communities and create social capital, and have an advantage of lower-cost, accessibility, minimal administrative procedures, no collateral requirements, low transaction costs, flexible terms and in-depth information about faming communities over formal institutions (Hirschland et al., 2008; Zeller, 2006; Nelson, 2013). Properly managed financial cooperatives can be successful to the extent of competing with formal financial institutions (Meyer, 2014). Disadvantages of

MOIs include limited product offerings, potential unreliability and vulnerability to collapse or fraud because of corruption, lack of discipline, or collective shocks such as a natural disaster or a bad harvest (Robinson 2001).

The most important informal institution in many SSA countries is known generally as the Rotating Savings and Credit Association (ROSCA). Community - based savings clubs were observed as early as the late 19th century in West African countries (Ghana and Nigeria), as well as in Asian countries (China and India), (Entz et al, 2016). ROSCAs were described by anthropologist Ardener (1962), as an association formed upon a core of participants who agree to make regular contributions to a fund which is given, in whole or in part, to each contributor in rotation. The ROSCA pools money to circulate among the members in turn. Several people form a group and contribute an agreed amount on a regular basis. At each meeting (or round), the money is collected, and the total is given to one member on a rotating basis (Nelson, 2013). The system further reduces risk to members because it is time limited—typically lasting no more than 12 months.

 ROSCAs are an important savings and credit institution, with a lot of coverage in contemporary literature, and have raised the interest of researchers and academics for over 50 years now (Dallimore, 2013).

Scholars generally agree that ROSCAs are efficient in rendering benefits to its members and that they fill a gap that the formal financial services have failed to meet (Bouman and Harteveld, 1976; Delancey 1978; Adams and de Sahonero 1989). Rutherford (2000) asserts that ROSCAs provide an efficient and cheap financial tool. ROSCAs are characterized by having mechanisms to monitor credit worthiness and reliability and increases rural people's propensity to save (Delancey 1978; Adams and de Sahonero 1989).

As noted by Nelson (2013) a ROSCA's simplicity is counterbalanced by risk and lack of flexibility:

   1 All ROSCA members receive the same amount of money in a

predetermined order. Each must wait her turn regardless of need, and there is no flexibility to contribute more or less than the agreed amount.

2   The fund does not grow in value, as no loans are made and no interest is   paid.

3   Those who are last in line risk not receiving their pay out if the group disbands. When a ROSCA collapses, members who have not yet received their proceeds have no recourse.

The Accumulating Savings and Credit Associations (ASCAs), which was popularized by CARE Niger in the 1990's is a variation of the ROSCA. An ASCA is a more flexible and more complex group savings mechanism than a ROSCA (Nelson, 2013)

Abhijit and Matthews (2009) explain that as opposed to ROSCAs, in ASCAs the saved money is not given to each member on a revolving basis but kept in a central pot for a period of 9 - 12 months, at which time it is divided out amongst participants. This 'share-out' is often timed to coincide with seasons where households require additional cash such as the planting season. In addition to lending to group members, non-members   can also borrow at higher interest resulting in a greater profit at the end of the period. Nelson, (2013) adds to this and explains that while all members save, not everyone borrows; members borrow only when needed, in amounts that they and the rest of the members are confident will be repaid. This model is also alternatively called the Internal Saving and Lending (ISAL) scheme (Nelson, 2013).

2.12.2. Village Savings and Loan Associations (VSLA)

Village Savings and Loans Associations (VSLAs) are a more structured, transparent and democratic version of informal savings groups (www.vsl.net). The web site goes on to point out that VSLAs were first developed by Care International in 1993 and were designed to fill the gap not met by MFIs who

were unable to profitably service rural areas. VSLAs aim to serve rural farmers who experience irregular sources of income. They aim to assist households in managing cash flow and in accessing lump sums for life cycle events. VSLAs facilitate the intermediation process of small amounts at very low costs. They help to overcome the problems of sustainability, high transaction costs, and weak incentives to save (Allen and Staehle, 2007; Ksoll *et al.* 2016). Whereas ROSCAs multiply without external facilitation, VSLAs only do so to a limited extent, thus requiring the facilitation of, say, an NGO, perhaps due to reasonably complex accountability features (Ksoll *et al.* 2016; Mwansakilwa *et al.*, 2017; Allen & Staehle 2007; Brannen & Sheehan-Connor 2012; Rasmussen 2012)

Brannen & Sheehan-Connor 2012 explains that VSLAs are self-selected groups of up to 25 individuals. The group elects a committee to ensure transparency. Members save through the purchase of shares, which vary depending on the circumstance of each member. Members can borrow up to three times the amount they have in shares as agreed. Groups may also form a social fund that acts as a type of insurance, available to members. By 2012 there were over six million active participants in 58 countries (VSL Associates n.d.).

2.12.3. Self Help Groups

Beginning in the 1980's, the Indian Mysore Resettlement and Development Agency (MYRADA) piloted providing credit to members of SHGs, who were primarily previous members of cooperatives setup by MYRADA (Eden et al, 2014). There are over 1.6 million SHGs in India with a total of over 30 million members (Hisrchland, Jazayeri et al. 2008). In the SHG Approach the money is saved by all group members themselves and the savings and other income such as interest payments are kept within the Self Help Group. Loans are advanced to group members based on the group's constitutional rules. SHGs are formed through a promotion agency such as a bank or an NGO, which obtains money from a bank for on lending to the SHG (Swain, 2009).

Members join SHGs both to save (at least initially) and to access loans. During the initial months, members focus on building the group fund to increase the amount available for internal lending and, more important, to become eligible for larger, external loans. Once the group has saved the amount that the bank requires to access wholesale loans, members often stop saving with the group (Isern et al. 2007). SHGs may go beyond savings and lending to also address human rights especially children and women's rights, and financial literacy (Eiden et al, 2014). SHG are normally facilitated through training and education by NGOs.

Ledgerwood and Jethani (2012) noted that financial education for SHGs help to achieve the following:

- Increase members' knowledge of how to manage money, especially as they have access to small loans and lump sums that were not available to them prior to joining the group
- Enable members to plan for future expenses
- Allow members to compare products, an especially critical skill for those who use their group experience to gain access to formal microfinance institutions (MFIs) and banks
- Help members to understand the costs and benefits of the various forms of mobile money and electronic wallets to which they will increasingly have access.

2.12.4. Village Banks

Mashingo & Kabir (2016) describe Village Banks (VBs), also commonly referred to as community banks, as rotating saving and credit association institutions, which result in saving mobilization, low transaction costs and the creation of social capital. Jones and Dallimore (2009) define village banks as semi-formal and self-sustaining financial institutions, which are owned, financed and managed by the community members themselves and sustainably provide banking services to community/village members. Village

banks may however receive support from a formal institution such as a MFI (Dupas et al., 2012) Shareholding by the villagers, according to Nigrini (2001), enables easy entry for new members and qualifies each member to vote for a board of management responsible for, inter alia, approving loans, setting fees and financial accounting. Village banks are solely financed by the community and are responsible for providing appropriate financial services such as savings deposits, credit and other financial services to their members and their operational structure reduces transaction costs and removes the need for collateral (Department of Agriculture, Forestry and Fisheries, 2009).

Unlike with the conventional Microfinance Institutions, levels of the interest rates are low (5%-10%) and are decided by the members (Mashingo et al., 2016). Interest earned on loans goes directly to the group. This demonstrates the focus of Village Banks on assisting the poor to improve their living standards through introducing some income generating activities (GIZ, 2014). The Village Bank also has an account opening and withdrawal fee, deposits are not insured by the central Bank and do not pay interest (Dupas et al., 2012). GIZ (2014) describe Village Bank as a community-owned and operated entity that receives support from a local microfinance institution (MFI) or NGO to manage the risk of fraud and that no ATM services are available, so savings are illiquid beyond the opening hours of the bank. Dupas et al., (2012) elucidate that the Village Bank requires the formation of a group of at least 5 people who approve the purpose and amount of each other's loans, and who serve as mutual guarantors. To take out a loan, borrowers must purchase a share in the bank. Borrowers are then eligible to borrow up to four times the value of shares owned. In addition, the bank requires borrowers to attend several training sessions on loan management. In a study by Dupas and Robinson (2011) participation in a village bank may be limited by perceptions of unreliability and fears of embezzlement of funds by bank officials.

2.12.5. Savings and Credit Cooperatives (SACCOs)

Onchangwa, Odhiambo, Sagwe, and Stella (2013) define Savings and Credit Co-operative Societies (SACCOs) as cooperatives, which provide their members with convenient and secure means of saving money, and obtaining credit at affordable interest rates. In 2011 SACCOs served approximately 120 million members in 87 countries around the world (Mwakajumilo, 2011). The first true experiences in the area of savings and credit cooperatives (SACCOS) in Sub-Saharan Africa were to a large extent promoted by missionaries whose work was consequently supported by national governments. (PFCMP *et al.,* 2005, cited by Mwakajumilo, 2011).

Branch (2005) explains that in the SACCO model each member buys a share and there is a limit to the number of shares one can buy. The cost of a share is set by the cooperative and is equal for all participating members. The share price is subject to change over time. Members deposit money with the cooperative and can borrow from it. Profits are either reinvested in the cooperative or members are paid dividends based on their average savings balances or share ownership (WOCCU 2011). This results in affordable loans for members or high returns on savings.

Ledgerwood (2013) points out that SACCOs are subject to the country's laws and they are required to pay taxes and that a volunteer board of directors elected from the membership usually governs cooperatives. Ledgerwood (2013) further points out that although many SACCOs struggle with poor management, they provide substantial financial services in developing countries.

2.12.6. Savings Banks

Christen, Rosenberg, and Jayadeva (2004) define Savings Banks as financial institutions that are regulated by the banking authorities and are both publicly and privately owned whose main objective is to provide savings services to a

broad range of people without necessarily maximizing profits. Research conducted by the World Savings Banks Institute in 2006 showed that savings banks hold three-quarters of the 1.4 billion accessible accounts provided by financial institutions and that their savings accounts have low or no minimum balance requirements and low or no fees (De Noose 2007).

2.12.7. State Banks

Young and Vogel (2005) observed that most government-owned banks are founded to serve the agriculture sector and that their primary activities include extending credit and savings services to promote small-scale farming production, Small and Medium Enterprises (SMEs), and other rural economic activities. In addition agricultural banks may be established to correct market failures and provide financial services to rural communities or high-priority economic sectors. They further pointed out that government involvement and guarantee creates a safety net, limits their impetus to operate profitably, poor loan recovery practices, frequent loan write offs create a weak credit culture and crowds out the private sector to operate in rural markets.

2.12.8. Private Commercial Banks

Ledgerwood (2013) describes commercial banks as having a wide range of financial product offering of all financial service providers, typically providing a comprehensive variety of payments, credit, and savings services. Also that commercial banks engage in microfinance in three ways: (1) by expanding their product offering to micro clients—referred to as downscaling—either through the creation of a separate internal unit or through a new subsidiary, (2) by creating a new institution—referred to as green fielding—for the specific purpose of offering regulated formal financial services to the poor, or (3) by establishing an agency relationship with an experienced microfinance organization or other provider.

2.12.9. Value Chain Financing

Miller (2013) defines Value Chain Financing (VCF) as an approach that seeks to reduce costs and lower the risks of lending by understanding risks and structuring financing (that is, fitting the conditions) to fill the needs of participants within a value chain. Miller (2013) further elaborates this definition by explaining that VCF refers to the flow of funds *to* and *through,* or among, the various actors in a value chain and that it uses an understanding of production, value added, and marketing processes to determine financial needs and provide financing to those involved. It uses risk and competitive information to provide financial services designed to meet clients' needs within the value chain in which everyone involved has a lodged interest (Miller, 2011). Value chain finance provides an opportunity to increase the financing prospects for agriculture, improve efficiency and repayments in financing, and strengthen value chain linkages among participants (Miller and Jones, 2010).

In illustrating VCF Miller and Jones (2010) use an example of value chain finance when traders commonly provide finance to farmers for harvest, inputs or other needs both related to the agricultural chain during the production cycles. The traders in turn receive finance from millers and processors who in turn may be financed by banks and/or wholesalers or exporters who are farther along the value chain.

Shwedel (2007) gave a good example of VCF in the flower value chain in Mexico. In this chain Rabobank loans farmers' needs for working capital, equipment and technology. In the same value chain Rabobank also finances the equipment distributor who provides services to the farmers. The bank is comfortable financing the farmers because the bank knows them and understands their marketing system. The farmers market their produce to a specific auction market in Holland, and Rabobank finances the buyers in that market. By doing this, the bank locks up the financing of the whole chain and has an in-depth understanding of the chain, i.e. producers, equipment

suppliers, and buyers. The bank also knows that the farmers receive their money through a Rabobank account, hence the bank can directly debit their accounts for loan repayments thereby minimizing side marketing.

2.13. Summary

This chapter explores from literature the concepts that are empirically examined in chapters 4 and 5 of this thesis. The concepts provide the foundation on which the empirical investigations that are meant to address the specific objectives of this study will be built. Insights to be drawn from the literature research include the confirmation that rural agriculture faces serious impediments including deliberate exclusion from support by both formal and informal financial service providers.

Governments have always tried to support agriculture through credit schemes but these efforts have failed and at times exacerbated the rural finance gap. There has however been a paradigm shift from the credit first approach to a financial market systems approach, which emphasise more sustainable approaches and innovations to rural and agricultural financing. Recently Value Chain Financing mechanisms have emerged as more sustainable as they focus on strengthening whole value chains instead of individual players in the value chain. Despite the paradigm shift, policy and institutional failures in the rural financial markets still prevail and the rural finance gap still persists in many developing countries.

The next chapter is a review of literature on rural financial markets within the context of Zimbabwe, the target country of this study.

CHAPTER 3.RURAL FINANCIAL MARKETS; THE ZIMBABWE CONTEXT

3.1. Introduction

This chapter moves away from the general literature review presented in chapter 2 to focus more on Zimbabwe, the country of this study. It presents from literature a review of Zimbabwe's rural and agricultural financial markets spanning the collonial and the post independence eras. A historical review is given from 1890 to the present. Section 3.2 gives the colonial era review and section 3.3. gives the historical evolution of the rural financial markets post Zimbabwe's independence in 1980. Section 3.4 reviews literature on the constraints to financial inclusion of smallholder farmers in Zimbabwe. The chapter ends with a discussion of the policy failures and institutional weaknesses in Zimbabwe's rural financial markets.

3.2. The Evolution of financial Access in Zimbabwe

3.2.1. 1890- 1980

The development of means of saving amongst the poor in Zimbabwe started with the concept of burial societies during the early years after colonial occupation in 1890 (Raftopoulos and Lacoste, 2001). Members of a burial society paid a joining fee and monthly subscriptions. When an immediate family member died, the member of the burial society was paid a lump-sum payment (Hall, 1987).

African professionals established Friendly Societies to provide loans to finance household needs and bigger financial projects. The friendly societies included the Central African Mutual Association, the Bantu Trading Cooperative Society (1938), the First African Friendly Society (1960) and the United Consumer Cooperative Society (1964), all of which were short lived (Raftopoulos and Lacoste, 2001). These efforts did not succeed because of political and legal constraints from the colonial state, and poor organizational management skills. Colonial legislation including the Land Apportionment Act

(1930), the Native Urban Areas Registration and Accommodation Act (1946), restricted Africans owning and utilising land in rural and urban areas (Raftopoulos and Lacoste, 2001). This constrained Africans to provide collateral for credit from the financial service providers.

By the time of the emergence of the savings clubs in the 1960's, there had already been some local experiences and attempts in savings and credit (Brand 1987, Chimedza 1984).

On 11 November 1965 the colonial Rhodesian government declared the Unilateral Declaration of Independence (UDI) from the British Empire (Bayer, 2003). As a result of the UDI the country was put under international mandatory sanctions because of widespread human rights violation of the indigenous black population. In order to burst sanctions the Rhodesian government instituted economic controls. As a result the economy was one of the most controlled economies in SSA (Kadenge et al, 1992). Rhodesia's economy was dichotomous, comprising a poor and colonially marginalised black majority and an economically empowered and dominant white sector (Davies, 1990). Blacks earned about one tenth as much as whites (Travel document Systems, 2003).

Brother Francis Waddilove, a Catholic missionary established the first savings club in 1963 in what was then Southern Rhodesia (Raftopoulos and Lacoste, 2001). The objective of the savings club was that the members could accumulate enough money to purchase agricultural inputs in preparation for the rainy summer season. This model was scaled-up by the Catholic Mission at Silveira House in 1968. Members of the savings club were to contribute savings for a period of two years after which they would qualify to receive loans equivalent to not more than 10% of their accumulated savings for productive purposes. The number of clubs reached a high of 3000 in 1975, with 60 000 members (Raftopoulos and Lacoste, 2001). Activities were however severely hampered by the war of liberation between 1976-80,

(Chimedza, 1984).

During this pre-independent era, the agricultural sector, however, due to the colonial set-up that existed, was divided into three distinct sub sectors, the large-scale commercial farming, Small-Scale Commercial also known as African Purchase Areas and communal sector (RBZ, 2006). White commercial farmers had freehold title to their land, while communal farmers had user rights (Ibid). The land bank, which was formed in 1912, was in 1971 transformed to the Agricultural Finance Corporation (AFC) (RBZ, 2006). In 1998, the AFC was converted into the Agricultural Bank of Zimbabwe (Agribank), which is a commercial bank with a bias towards financing farming activities (RBZ 2006).

3.3.1. Post Independence (1980)

At Independence in 1980, Government through statutory instruments directed AFC to extend loans to all farming sectors including communal farmers (CSO, 2006). In the early 1980's the Agricultural Finance Corporation (AFC) played a central role in extending loans to small scale farmers. The World Bank, EEC, DANIDA, and the Japanese government among others, supported this policy. Credit by the AFC to both small farmers in the resettlement areas and mainly white commercial farmers, increased from Z$15 million in 1983/84 to Z$35 million in 1984/85 (Bond, 1998; Raftopoulos and Lacoste, 2001). Smallholder indebtedness and levels of debt defaulting increased as a result (Bond, 1998). Attempts to 'throw money at the problem' failed to deal with fundamental constraints such as unsustainable interest rates, and the inefficiencies of the controlled marketing system. In the 1990's the process of commercialising the AFC under a new bank, AGRIBANK, resulted in further limitations for the poor communal area farmers.

Moyo (2011) observed that the Commercialisation of other Government initiatives under the Economic Structural Adjustment Program (ESAP) such as the Small Enterprises Development Corporation (SEDCO) and the Zimbabwe Development Bank (ZDB) led to a greater emphasis on collateral based

lending. In addition many difficulties arose over the complex procedures for accessing credit.

Figure 3-1 shows the trend of agriculture sector borrowing from commercial banks as a percentage of total borrowing from 1965 to 2004. Following the inception of the Fast Track Land Reform Programme in 2000, the proportion of commercial bank loans to the agricultural sector declined from a peak of 91% in 1999 to 14% in 2000. The proportion remained around this level until in 2005, when it rose to 24% (RBZ, 2006).
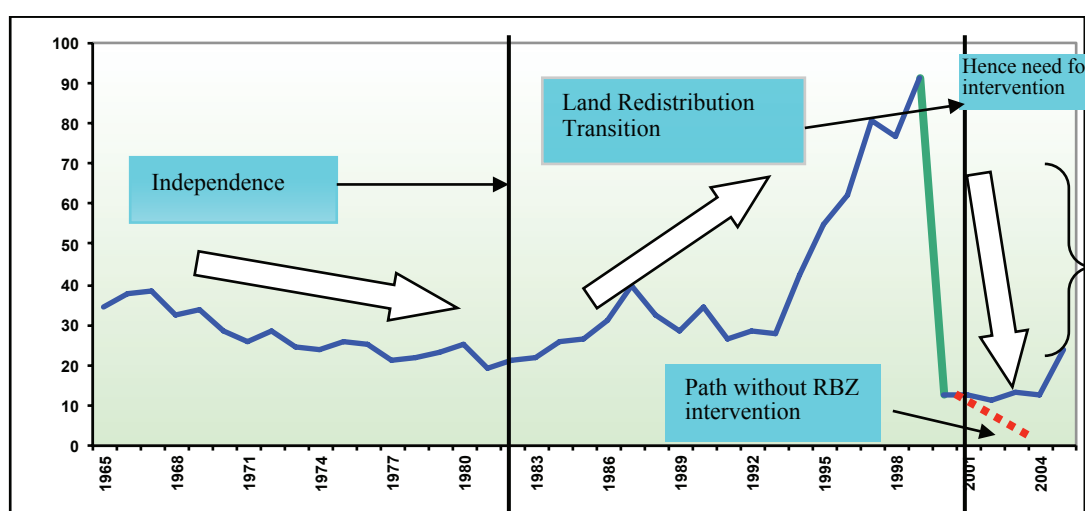
Figure 3-1 Agriculture Sector Borrowing from Commercial Banks as a % of Total Borrowing

Source: Adopted from RBZ Monetary Policy Statement 2008

Prior to 2009, agricultural finance was provided by the state through Agribank, the Reserve Bank of Zimbabwe (RBZ), Commercial Banks, Microfinance Institutions (MFIs), Commodity Brokers, Farmer Contracting Agencies and NGOs. The Ministry of Agriculture provided agricultural credit in the form of direct input support to farmers, under the administration of its parastatals and departments. In this regard, the Grain Marketing Board (GMB) administered a scheme that distributed seasonal inputs; the Livestock Development Trust (LDT) focused on Heifer Support; the District Development Fund (DDF) administered tillage support; ARDA administered the Irrigation Rehabilitation Support Facilities and the Ministry of Agriculture with the support of the Army,

administered the Maguta and Champion Farmer Input Support Scheme Facilities. The RBZ administered the Agricultural Sector Productivity Enhancement Facility (ASPEF) and the Farm Equipment and Mechanisation Support Programme (World Bank, 2006). All of these loans were provided at below market interest rates thus crowding out private banks' own lending capital/capacity (Masiyandima, Chigumira & Bara, 2011).

The 2012 FinScope MSME Survey and the 2014 FinScope Consumer Survey revealed that 23% of Zimbabwe's adult population was financially excluded, only 30% of Zimbabwe's adult population made use of banking services as at 2014, only 14% of MSME owners were banked and only 1% of adult population made use of capital market services. Further, the World Bank Consumer Protection and Financial Literacy Diagnostic Report of 2014 revealed low financial literacy, despite Zimbabwe having a high rate of general literacy.

Zimbabwe has, in the past, instituted a number of initiatives to broaden access to financial services. Notwithstanding the strides made in the pursuit of an inclusive financial sector, gaps still exist in the level of access to, usage and quality of financial products and services, as well as the impact on the lives of those consuming the products and services. The gaps are particularly pronounced among special groups such as Micro, Small and Medium Enterprises (MSMEs), women, youth, rural population and the small-scale agricultural sector (RBZ, 2016)

Zimbabwe is an agro-economy with agriculture contributing about 12% of the country's GDP in 2014 and more than 60% of inputs to the manufacturing sector (RBZ, 2016). In the premises, food security, employment creation and poverty alleviation are closely related with the development of agriculture (Ibid). Access to financial services particularly by smallholder farmers, however, remains a major bottleneck to agricultural performance in Zimbabwe (RBZ 2016).

In a supplement to the 2007 national budget, the central bank (RBZ) acknowledged that that there is indeed a financing gap for agriculture. In the RBZ supplement (pp. 56) it is stated as follows;

> "The newly resettled farmers are experiencing challenges in accessing credit from the private sector financial institutions due to lack of collateral…That it was against that background that the Authorities (RBZ) stepped in to **bridge the financing gap with concessionary finance** to the agricultural sector".

In Zimbabwe, land is owned by the state and the current land tenure system for current holders or users does not permit transfer of ownership. It then becomes difficult for banks to extend credit securitised by land given the complexities in both ownership and transferability (Masiyandima, Chigumira & Bara, 2011; Zumbika, 2006).

3.4 Agricultural Financial Access in the Multicurrency Era

Zimbabwe experienced a decade of recession up to 2009 where the Zimbabwean Dollar lost value against major currencies. The United Nations Operational Rate of Exchange which was at Z$117:1US$ in May 2006 dropped to Z$35 X 10^{15}: 1USD in November 2008 (Chipika and Malaba, 2011). This eventually led to dollarization informally during the last half of 2008 and eventually the Zimbabwean dollar was abandoned for a multicurrency system in January 2009. This ushered a new economic dispensation of relative price stability, improved business confidence and increased capacity utilisation (from 10% to around 40% by end of 2009) positive economic growth (5.7 per cent in 2009) (Chipika & Malaba, 2011)

Masiyandima, Chigumira & Bara (2011) noted that since the introduction of the multi-currency system in 2009, banks in Zimbabwe have maintained between 10% and 25% of their loan portfolio in agriculture. With total financial sector deposits of approximately US$2.5 billion in 2010, for example, this translates to more than US$250 million being outstanding bank loans to

farmers. They also note that factors that are considered by banks in appraising farmers' loan applications include availability of collateral security, past farmer production performance, farmer's own financial contribution and past loan performance.

A survey by Masiyandima, Chigumira & Bara (2011) shows that among the reasons for bank loan rejection by farmers, were; lack of collateral security accounting for at least 60% of the rejected loan applications followed by poor past farmer production performance, which accounted for 20% of the rejections, poor past loan performance, accounts for at least 37% of loan rejection, while lack of collateral accounts for 30% by the institutions. These reasons are shown graphically in figure 3-2.
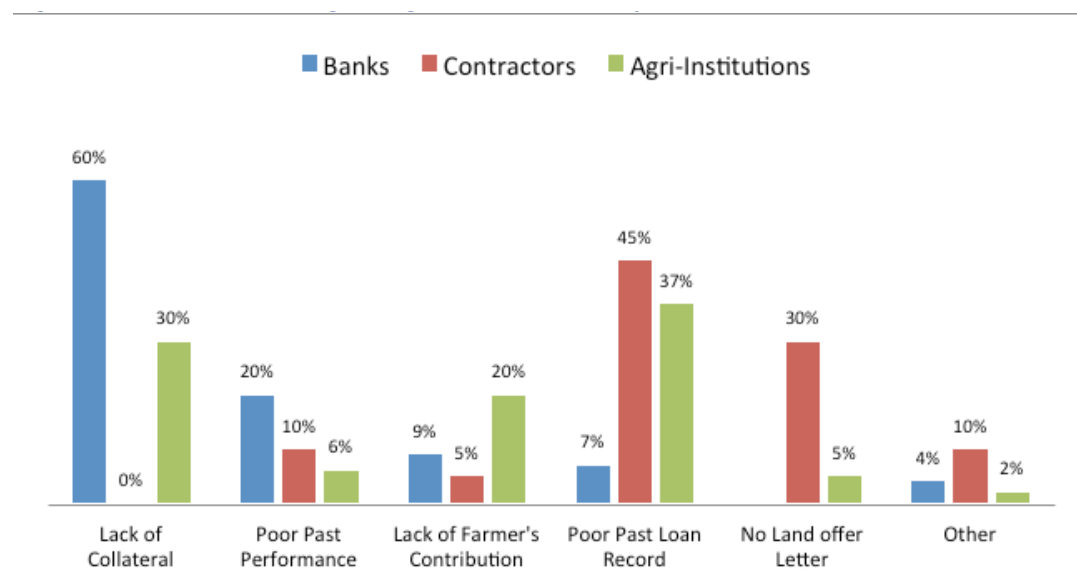
Figure 3-2 Factors Leading to Agricultural Loan Rejection

Source: Masiyandima, Chigumira & Bara, 2011

3.5. Constraints to Financial Access for Smallholder Farmers in Zimbabwe

Barriers and constraints to financial inclusion in Zimbabwe can be classified as demand side, supply side and regulatory (RBZ, 2016). RBZ (2016) further elaborate that the constraints include: under demand- low income levels, failure to meet minimum account opening requirements, inadequate information on financial services and products, lack of confidence in the financial system, financial illiteracy and inflexible implementation of Anti Money Laundering (AML) measures; Under the supply side – absence of robust credit information system, poor infrastructure in rural areas leading to financial institutions reluctance to establish branches and lack of skills to understand the dynamics of projects of those at the bottom of the pyramid; regulatory – absence of coordinated national policy and strategy on financial inclusion, weak consumer protection regulatory framework and capacity and resource constraints.

The FinScope Consumer Survey Zimbabwe 2011 also indicated that farming is a main source of income for 29% of adult Zimbabweans. Given the seasonal nature of this work and the high vulnerability due to various risks such as natural disasters and low selling prices, most farmers face uncertainties (and as such are often not able to employ full-time staff). Although more people residing in rural areas rely on farming, access to agricultural finance and insurance is limited (FinScope, 2011). There is a need for affordable and flexible solutions, including loan and savings products to cover seasonal input (e.g. fertiliser, seeds, labour, etc.) and fixed assets (e.g. tractors, implements, land improvements). In addition, there seems to be a demand for tailored affordable agricultural insurance that could help to address some of the risks and uncertainties farmers face (Ibid).

 Risks in agriculture are high (policy, market, production and environmental risks), farmers lack formally recognised collateral, there are high costs in lending to smallholder farmers, microfinance institutions lack sufficient funds for lending and repayment structures may not suit agriculture (LFSP, 2017)

Distance is one of the most important determinants of transaction costs. Geography, ethnicity, culture, and social class create distance between borrowers and lenders (Gobezie 2005). The reduction of transaction costs needed to increase the demand for financial services critically depends, therefore, on the provision of some of the most basic public goods and physical infrastructure: including roads, telephones, mail services, literacy, electricity (Gobezie 2005). On the clients end, the most practical problem faced by MFIs is the very low absorptive capacity of the majority poor in rural areas, greatly constraining the potential positive impacts of access to microfinance programmes (see Dawson, 1997)

The majority of rural Zimbabweans remain completely cut-off from the traditional banking services (Mago, 2013). The same was echoed by the Reserve Bank of Zimbabwe (RBZ) Governor in his April 2007 Monetary Policy Statement (ZAMFI, 2007). The monetary policy statement pointed out that there was need to rope in the rural communities for inclusion into the financial system. According to ZAMFI (2007), the per capita banking facility ratios in rural areas indicate unacceptable levels of financial exclusion of the rural populace. The situation on the ground however suggests that the demand for microfinance resources is very high (Mago, 2013).

In a historical overview study of the Microfinance sector in Zimbabwe, Mago, (2013), noted that microfinance resources are on demand because of their ability to meet the capital needs of the poor who are considered 'unbankable' by the formal finance sector. Mago (2013) further points out that traditional banks are not willing to take the risk because they rate the sector 'credit unworthy' thereby creating a huge gap that gets filled by private moneylenders who usually charge usurious rates of interest hence exploiting the vulnerable poor people. Mago (2013) further notes that traditional banks argue that it is problematic to provide financial services to the rural areas because of their remoteness, which brings very high transaction costs hence raising sustainability questions. Other challenges noted for Zimbabwe include

adverse selection and information asymmetry leading to moral hazard.

In Zimbabwe, banks, Post Office Savings Bank (POSB), Microfinance Institutions (MFIs), Associations (ROSCAs), Regular (non-rotating) Savings and Credit Associations- RESCAs, Non-Governmental Organizations (NGOs), relatives and friends, and private moneylenders supply microfinance (Mago, 2013).

3.6. Financial Access Policy failures and institutional weaknesses

Zumbika (2006) notes that most farmers in Zimbabwe do not have title to their land, particularly in Communal, Old resettlement, A1 and A2 Fast Track Land Reform Programme (FTLRP) settlement schemes; therefore commercial banks are reluctant to extend loans to these farmers because they lack adequate and acceptable forms of collateral. To enforce loan contracts, the communal tenure system is another unresolved constraint. The communal tenure system gives an individual a secure and normally inheritable right to property rights, the land however belongs to the state, which may reduce investment incentives. Zumbika (2006) further points out that due to perceived and severe moral hazard problems, private sector institutions have been reluctant to service rural financial markets in the absence of collateral and a legal and regulatory framework. Probable solutions to this challenge include: titling and registering land; reforming the law of secured transactions, such as legally acceptable forms of collateral; establishing legal registries and expanding the scope for private operation; lowering the cost of registration and foreclosure; drafting specific, clear and limiting homestead provisions; and removing interest rate ceilings (Yaron et al., 1998)

A number of studies in developing countries have concluded that flexibility, rapidity and ease of transactions are key to the effectiveness of rural financial markets (Adams et al., 1984; Meyer, 1993; Moller, 1987). The heterogeneity and often the urgency of financial needs require services that respond to their demands swiftly and in a variety of ways. These features are absent from operations of formal financial institutions in Zimbabwe, making it difficult and

sometimes irrelevant for low-income rural households to access available financial services (Chimedza, 2006)

Perhaps the biggest failure of the present rural financial system was its founding assumption that poor people were too poor to save and required cheap credit (Chimedza, 1994; Zumbika, 2000). This assumption seriously undermined the ownership and sustainability of the institutions serving the rural community. Chipika & Malaba (2011) points out that reliance on public funding not only exposed such institutions to political manipulation but also subjected them to severe budgetary constraints in the event of macro-economic decline as Zimbabwe has experienced in the post land reform period. Furthermore, economic reform induced fiscal containment virtually eliminated subsidies and significantly reduced other government support leading to the practical drying up of credit as the trends from 2000 showed (Zumbika, 2006)

3.6. Summary

This Chapter presented a brief historical overview of Zimbabwe's rural financial markets from the pre-colonial to the present era. It showed that rural finance dates back to the early 1890's soon after Zimbabwe's colonisation by Britain. There have been documented policy failures in attempts to address rural poverty through subsidised credit. Poor land tenure security has emerged to be a challenge dating back from the colonial era and has remained so to this date. The rural finance gap has also remained. The next chapters, 4 and 5, present complimentary empirical research studies aimed at contributing to the existing knowledge and suggesting policy recommendations to address the rural finance gap in Zimbabwe. Chapter 4 is a study to diagnose the determinants of access to credit and the intensity of borrowing (participation) with a view to contribute to policy solutions to address financial exclusion and narrow the rural finance gap in Zimbabwe.

CHAPTER 4.DETERMINANTS OF ACCESS TO AND LEVEL OF PARTICIPATION IN AGRICULTURAL FINANCIAL MARKETS FOR SMALLHOLDER FARMERS IN ZIMBABWE

4.1. Introduction

From the literature review of chapters 2 and 3, it has been established that there is indeed a finance gap for the smallholder communal farmer in Africa generally and Zimbabwe in particular. This chapter presents empirical study methods, results and discussion of the determinants of access to and intensity of participation in rural financial markets, the determinants of the choice to participate in formal financial markets and the determinants of the intensity of participation (as measured by the amount borrowed) once a farmer chooses to participate. The chapter is structured as follows; section 4.2 outlines the methodology comprising the analytical methods, model specification and data collection. Section 4.3 is a discussion of the empirical results and section 4.4 conclude the chapter with a summary of the findings.

4.2. Methodology

4.2.1. Analytical Methods

A double-huddle model as previously used by Sebata et al. (2014) was used to determine factors which inspire the decision of communal farmers to look for farming credit and the variables that impact their intensity of participation in agricultural financial markets once they choose to look for funding (Sebata et al. (2014). Characterization of the different ways through which smallholder farmers access and utilise agricultural finance was done through descriptive statistics generated from the Stata 13 computer program. Measures of dispersion and central tendency in addition to data normality tests were employed to carry out the detailed analysis.

The double-hurdle model originally devised by Cragg (1971) was used. The

model assumes that smallholder farmers make two sequential or independent decisions with regard to acquire credit each of which is determined by a different set of explanatory variables. In order to observe a positive level of acquisition, two separate hurdles must be passed. A distinct latent variable is used to model each decision process. Each hurdle is conditioned by the smallholder farmer's socio-economic and environmental as well as credit institution characteristics. The model considers the possibility of zero outcomes in the second-hurdle arising from the individuals' deliberate choices or random circumstances and hence assumes that zero values can be reported in both decision stages (Greene, 2003).

The standard Tobit model originally formulated by James Tobin (1958) was the first model to attempt to handle a censored dependent variable. The zeros reported in the first-stage arise from zero access to credit by the smallholder farmers; and those in the second hurdle come from zero loan acquisition from a credit source due to a farmer's deliberate decision or random circumstances. A different latent variable is used to model each decision process, with a Probit model to determine participation decision and a Tobit model to determine the intensity as measured by the credit amount as shown below;

$$y_{i1} = w_i\alpha + v_i \qquad \text{Participation Decision}$$

$$y_{i2} = x_i\beta + \mu_i \qquad \text{Credit Amount}$$

$$y_i = x_i\beta + \mu_i \qquad \text{if } y^*_{1t} > 0 \;\; y_{t2} > 0$$

$$y_i = 0 \qquad \text{Otherwise} \qquad\qquad (4.1)$$

Where y_{i1} is a latent variable describing the household's decision to participate in the credit finance, y_{i2} is a latent variable describing smallholder acquisition amount, y_i is the observed dependent variable, w_i is a vector of variables explaining the participation decision, x_i is a vector of variables

explaining the acquisition decision, v_i and u_i are the respective error terms assumed to be independent and distributed as $v_i \sim N(0,1)$ and $u_i \sim N(0,\sigma^2)$.

The model is estimated using maximum likelihood estimation procedures. However, to overcome the inconsistency of such estimates in the presence of heteroscedasticity and non-normality of the error terms, necessary specification adjustments are made. To allow for heteroscedasticity, the variance of the errors is allowed to vary across observations by specifying it as a function of a set of continuous variables. In this analysis the standard deviation is specified as:

$$\sigma_i = \exp\left(z_i{'}\, h\right)$$

where z_i are some elements of x_i. An inverse hyperbolic sine (IHS) transformation of the dependent variable will produce consistent parameter estimates for both models in the presence of non-normality (Burbidge *et al.*, 1988). Reynolds and Shonkwiler (1991) were the first to apply this transformation to the Tobit model. For the double-hurdle model the transformation is:

$$T(\theta y_i) = \log\left[\theta y_i + (\theta^2 y_i^2 + 1)^{1/2}\right] / \theta = sinh \sinh^{-1}(\theta y_i)/ \theta \tag{4.2}$$

where θ is an unknown parameter. According to Reynolds and Shonkwiler (1991) the likelihood equation for the independent double hurdle model allowing for heteroscedasticity and a non-normal error structure can be written as follows:

$$L(\alpha, \beta, h, \theta) = \prod_0 \left[1 - \phi\,(w_i{'}\alpha)\phi\left(\frac{x_i{'}\beta}{\sigma_i}\right)\right] \text{ X}$$

$$\prod_1 \left[\left(1 + \theta^2 y_i^2\right)^{-1/2} \phi(w_i{'}\alpha)\sigma_i^{-1}\, \emptyset\left(\frac{T(\theta y_i) - x_i{'}\beta}{\sigma_i}\right)\right] \tag{4.3}$$

The authors posit that the estimated coefficients in the double-hurdle model cannot be interpreted in the same way as in a linear regression model. To assess the impact of the regressors on the dependent variable, it is necessary

to analyse their marginal effects. This encompasses decomposing the unconditional mean into the effect on the probability of acquiring and the effect on the conditional credit amount and differentiating these components with respect to each explanatory variable. The unconditional mean can be inscribed as:

$$E(y|x_i) = P(y_i > 0)E(y_i|y_i > 0) \tag{4.4}$$

The probability of participation and the amount of credit conditional on participation are (Yen and Jones, 1997):

$$P(y_i > 0) = \phi(w_i'\alpha)\phi\left(\frac{x_i'\beta}{\sigma!}\right) \tag{4.5}$$

$$E(y_i \mid y_i > 0) = \phi\left(\frac{x_i'\beta}{\sigma_i}\right)\int_0^\infty \left(\frac{y_i}{\sigma_i\sqrt{a^2+b^2}}\ \varnothing\left(\frac{T(\theta y_i)-x_i'\beta}{\sigma_i}\right)\right)dy_i \tag{4.6}$$

For the continuous explanatory variables, these marginal effects are used to calculate elasticity at the sample means. For the discrete or categorical variables, the marginal effects are used to calculate percentage changes in the dependent variable when the variable shifts from zero to one, *ceteris paribus*. Thus;

$$y = \begin{cases} 1, if\ farmer\ is\ a\ participant \\ 0, if\ other\ wise \end{cases} \tag{4.7}$$

4.2.2. Model Specification

4.2.2.1. Determinants of Access and Participation

The empirical model used to estimate the truncated Probit model of agricultural finance access and participation among smallholder farmers is given below;

$$A_{iaf}^* = \ \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \ \beta_8 X_8 +$$

$$\beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + \beta_{14} X_{14} +$$

$$\beta_{15} X_{15} + \varepsilon_{iaf} \qquad\qquad (4.8)$$

Where,

β_0 is a constant and β_1 - β_{15} are parameters to be estimated

A_{iaf}^* = Agricultural finance access decision

X_1 = Age of the household head

X_2 = Gender of household head

X_3 = Household head's level of education

X_4 = Farmer saves money

X_5 = Farmer perception of loan repayment period

X_6 = Farmers perception of lending procedures

X_7 = Opportunity to take a second loan

X_8 = Financial market proximity

X_9 = Family labour

X_{10} = Farm size

X_{11} = Total livestock ownership

X_{12} = Attitude towards Risk

X_{13} = Extension Contact

X_{14} = Experience in credit use

X_{15} = Membership to SACCO

ε_{iaf} = Stochastic error term

4.2.2.2. Determinants of Participation Intensity

The determinants of participation intensity were measured by estimating the second hurdle equation. In this study the second hurdle employed a truncated Tobit model to determine factors affecting the actual amount of loan borrowed by a smallholder farmer. This stage used respondents who reported positive or greater than zero amount of loan borrowed. The truncated model is expressed as shown below;

$$Y_i^* = X'_{2i}\beta_2 + v_i, v_i N(0, \delta^2) \tag{4.9}$$

Y_i, is the identified amount of loan borrowed by the sample respondent and Y* ≥ 0. The specific truncated Tobit model used to determine the intensity level is given below as;

$$Y_{iaf}^* = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 +$$
$$\beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + \varepsilon_{iaf} \tag{4.10}$$

Where,

β_0 is a constant and β_1 - β_{15} are parameters to be estimated

A_{iaf}^* = Agricultural finance intensity

X_1 = Age of the house hold head

X_2 = Gender of household head

X_3 = Household head's level of education

X_4 = Farmer saves money

X_5 =Interest rate at borrowing

X_6 = Farmers perception of lending procedures

X_7 = Family labour

X_8 = Farm size

X_9 = Total livestock ownership

X_{10}= Attitude towards Risk

X_{11} = Experience in credit use

X_{12} = Membership to SACCO

ε_{iaf} = Stochastic error term

4.2.3. Definition of Variables and Working Hypothesis

4.2.3.1. Dependant variable

The dependent variable for the Probit analysis is of dichotomous nature representing small holder farmer's access to finance. This is to distinguish or discriminate between those that have access and those that have no access to finance in the study area. Y- Farmer access credit from financial market during the year. This is the dependent variable. It takes value of "1" for access "0" for otherwise.

4.2.3.2 . Explanatory variables of the study

Review of literature on the determinants of access to agricultural financial markets for smallholder farmers, past research findings and the author's knowledge of the agricultural credit schemes of Zimbabwe were used to establish set of questions and working hypotheses of this study. Demand responses were measured by whether a potential borrower has applied for microcredit or not and the intensity of participation (amount applied for). As discussed earlier, studies in the relevant literature identified various individual, business and lender-related variables that are considered to be key determinants of the decision to participate as well as intensity of participation of farming households. The effects of factors commonly measured include age, gender, educational level, family size, farm size, livestock ownership, farmer saves money, farmer's perception of repayment period, perception of lending procedures, opportunity to take a second loan, attitude towards risk,

extension contact, household income and expenditure, distance from nearest bank, value of assets, profit and membership to a social, farmer or savings group. Information on a similar set of explanatory variables have been collected from the survey

Thus, among these factors, which determine smallholder farmer access to finance and intensity in this study the demographic, socio-economic, communication and institutional factors are discussed below and summarised in table 4.1 below.

Table 4-1: Variables included in the Probit and Tobit Model

Independent Variables			
Variable	**Description**	**Measurement**	**Expected Sign +/-**
Age of the household head	Continuous Variable	Number years	+
Gender of household head	Dummy variable	Male=1 Female=0	+
Level of education	Categorical (last attended)	1= Illiterate; 2= Adult education; 3= Primary; 4= Secondary; 5= High school; 6= College/Vocational 7= University	+
Family Labour endowment	Man-equivalents	Less than 9 years = 0; 9-15=0.7; 16-49=1; above 49=0.7	-

Farm Size	Continuous - Total land size cultivated	Number of hectares	+
Total Livestock ownership	Tropical livestock unit	Cattle= 0.7; sheep = 0.1; goats = 0.1; pigs = 0.2; chicken = 0.01	-
Farmer saves money	Does the farmer save money	1 = Yes 0= No	-
Farmer perception of loan repayment period	Does the farmer perceive repayment period a constrain	1 = Yes 0 = No	-
Farmers perception of lending procedures	Does the farmer perceive the lending procedures a constrain	1 = Yes 0 = No	-
Opportunity to take a second loan	Does the farmer have a second chance to take a loan	1 = Defaulter 0 = Otherwise	-
Financial market proximity	Dummy	1 = 0 – 5 kilometres 0 = Otherwise	-
Attitude towards Risk	Does the farmer fear the risk to take a loan?	1 = Yes 0 = No	-
Extension Contact	Does the farmer contact the extension for information	1 = Yes 0 = No	+

Experience in credit use	How long has been using credit	Number of years	+
Membership of the Farmer	Does the farmer belong to any farmer organisation	1= Yes 0 = No	+

Age of the farm household head: It is a continuous variable, defined as the farm household heads age at the time of interview measured in years. Those farmers having a higher age due to life experience will have much better association with cooperatives and other formal credit institutions, and it was hypothesized that farmers with higher age may have more access to use credit.

Gender of the household head: this is a dummy variable that assumes a value of "1" if the head of the household is male and "0" otherwise. According to (Bulimic, Sebstad and Zeidenstein, 1979) "there are two major factors which restrict women's access to formal credit more than men's. These are related to women's lack of control over economic resources and the nature of their economic activity". With this background including the existing gender differences; male-headed households have mobility, participate in different meetings and have more exposure to information; therefore, it was hypothesized that male headed households have more access to use credit.

Literacy level: It is categorized in to illiterate and able to read and write or literate, it is a dummy variable. Farmers who can read and write are expected to have more exposure to the external environment and accumulate knowledge. They have the ability to analyse costs and benefits. The more educated the household head the more credit he will use for consumption purposes. According to Musebe et al, (1993), as the household gets more formal education, the probability of obtaining credit increases. Therefore, it

was expected that those farmers who can read and write have better credit requirement that leads to access to use credit sources.

Family labour Endowment: This refers to the total number of family members of the household who have the potential to work on the farm, which was measured in man equivalent. The larger the number of family labour, the more the labour force available for production purpose. The more the labour force available, lower is the demand for hired labour, this means no or low cost for hired labour. If demand for hired labour decreases due to availability of family labour the need for credit decreases. Therefore, family labour was hypothesized to have negative impact on access to credit.

Extension contact: This refers to the number of contacts with extension agents that the respondent made in the month. Farmers who have a frequent contact with extension agents are expected to have more information that will influence farm household's demand for credit from the formal sources. Therefore, it was hypothesized that this variable positively influences farmer's access to credit.

Membership of farmer to saving and credit association: This is a dummy variable which takes a value "1" for membership and "0" otherwise. Some of the smallholder farmers are members of farmer organisations and they get backing to finance their farming activities. Therefore, it was hypothesized that farmers who are members of saving or credit cooperation have more access to credit

Experience in credit use: This refers to the number of years the household head uses credit from formal financial institutions. A farmer having more experience in formal credit use will have higher tendency towards using the formal credit sources and vice versa. Hence, this variable is assumed to have positive influence on the dependent variable.

Farm size in hectare: It is the total land size cultivated (it is the sum of owned cultivated land, rented-in land and land secured through sharecropping

arrangements) by the household. It is a continuous variable. The larger the cultivated land size the more the labour required that demands additional capital that might be obtained through credit. The main hypothesis was that the farmer who cultivates larger size of land can utilize more capital and will demand for credit and therefore he/she will be more accessed to credit.

Total livestock ownership This refers to the total number of animals possessed by the household measured in tropical livestock unit (TLU). Livestock is considered as another asset which is liquid and a security against crop failure. As the total number of animals in the household increases, the household would be less likely to go for credit. This can be attributed to increase wealth and income base of farm households, which makes more money available in the households that minimizes demand for credit. Hence this variable was assumed to have negative influence on the dependent variable.

Attitudes towards Risk: The other factor, which influences the household's access to formal credit, is their attitude towards risk. Many farmers, as can be expected, are very risk-averse that even when credit is available, they do not like to venture into activities. This is due to risks of repaying loans that come from loss of crops due to seasonal changes, pest and insect damage. It will be measured based on the farmer's positive or negative perception. This is a dummy variable which takes "1" if they respond as they don't fear risk to take loans and "0" otherwise. Therefore, it was expected that farmers who are risk averse will not demand credit and it negatively affects access to use credit.

Opportunity to take a second loan: Loans taken by farmers are expected to be repaid based on the agreement made. According to the rule of financial market failure by farmers to repay their loans in time or to repay at all will forbid them from getting further loans. This is a dummy variable which takes a value "1" for non-defaulters and "0" otherwise. Therefore, it was expected that farmers who did not repay their loans will not have access to additional credit.

Physical distance of farmers from lending institutions: Farmers near the lending institutions have a location advantage and can contact the lender easily and have more access to information than those who live more distant locations. Therefore, location advantage was expected to increase access to use credit.

Farmers' perception of Loan repayment period: Formal credit institutions have rules and regulations that limit the time at which the borrower should repay the loan. If farmers fail to repay on time they will be sent to the court or their property may be confiscated. Due to this reason farmers fear taking loans from formal credit sources. This variable represents the borrower's perception of how the loan repayment periods and time discourages farmers from participating in credit market. This is a dummy variable which takes a value "1" for those who perceive it as a constraint and "0" otherwise. And it was hypothesized that, this variable negatively influences the dependant variable.

Farmers' perception of Lending procedures. To get formal loans farmers are expected to pass through different processes, which is time taking, cumbersome and sometimes difficult to understand. Schmidt and Kropp (1987) also reported that in most cases the access problem, especially among formal financial institutions, is one created by the institutions mainly through their lending policies. This is manifested in the form of complicated application procedures and restrictions. This variable represents the borrower's perception of difficulty of the lending procedure. It is a dummy variable which takes a value "1" for those who perceive it as a constraint and "0" otherwise. Therefore, it was expected that, this variable negatively affect smallholder farmer's access to credit from the agricultural financial market.

4.2.4. Data Collection

The population from which the sample was taken are communal farmers across Zimbabwe's eight provinces. One ward per province was purposively selected in order to ensure the sample covered respondents from across the

5 agro-ecological regions of Zimbabwe. In addition the ward had to be one in which communal farming is predominant. 950 households were randomly selected from the 8 wards. The proportion of each ward to the total population of the eight wards was used for weighting the number of randomly selected smallholder farmers per ward as shown in table 4-2. The sampling method was thus two stage (purposive and random) to give each household an equal chance of being interviewed. The lists of farmers were obtained from the Department of Agricultural Extension (Agritex). The household head was selected to respond to the questionnaire.

Table 4-2: Sampled Smallholder Farmers 2018

Province	District	Ward	Natural Agro-ecological Region	Ward population[a]	No of Communal farmers Sampled
Manicaland	Nyanga	13	1	2715	90
Matebeleland South	Insiza	3	4	5541	180
Matebeleland North	Umguza	10	4	3070	100
Masvingo	Masvingo	30	5	1568	20
Midlands	Gweru	16	4	6347	200
Mashonaland West	Zvimba	10	3	2438	80
Mashonaland East	Goromonzi	12	2	5438	170

Mashonaland Central	Bindura	12	3	3368	110
Totals				**30483**	**950**

[a]population of age 18+ 1

Interviews with respondents were done between October 2018 and January 2019.

The empirical results are presented in section 3.5. The descriptive statistics of the variables used in the Probit and Tobit models are presented followed by a discussion of the significant determinants of access to agricultural financial markets for smallholder communal farmers in Zimbabwe. The estimations were carried out using Stata 13 (Statacorp, 2009).

4.3. Empirical Results And Discussion.

4.3.1 Descriptive statistics of variables used in the Probit and Tobit Regression

The descriptive statistics of the variables used in the Probit and Tobit models are presented in table 4-3 below.

Table 4-3: Descriptive Statistics of variables used in the Probit and Tobit Regression

CATEGORICAL VARIABLES					
[A] VARIABLE	[B] UNIT	[C] % of Total respondents N=950	[D] % of C with access to credit N=365	[E] % of C without access to credit N=585	[F] χ^2 – value

Gender of household head	Male	55.5	62.3	37.7	5.371***
	Female	44.5	37.7	62.3	
Level of education	Illiterate	11.5	0	100	7.231***
	Adult Education	22	9	91	
	Secondary Education	39.5	6.5	93.5	
	College/Vocation	16	22.7	77.3	
	University	11	35.1	74.9	
Farmer saves money	YES	44	72.7	37.3	1.053
	NO	66	27.3	82.7	
Farmer perception of loan repayment period	Constraint	74.5	49.4	50.6	6.028***
	Not Constraint	25.5	60.3	39.7	
Farmers perception of lending procedures	Constraint	66	29.9	70.1	5.417***
	Not Constraint	44	58.4	41.6	
Opportunity to take a second loan	Yes	78	0	100	7.309***
	No	22	28	72	
Attitude towards Risk	Yes	52.5	3.9	96.1	2.819
	No	47.5	19.5	80.5	
Extension Contact	YES	44	70.1	29.9	6.375***
	NO	56	29.9	70.1	
Membership of the Farmer to a Saving or Credit	Member	62.5	35.1	64.9	1.142
	Non-member	37.5	64.9	35.1	

Cooperative					
Continuous Variable					
Variable	Unit	Mean of Total Respondents	Mean Total Credit Access	Mean Total of Non-Credit Access	t-value
Age of the household head	Years	48	50	49	-1.461
Farm Size	hectares	6	8	5	2.931***
Physical distance of farmer from financial market	kilometres	33	20	41	-3.782***
Family Labour endowment	Man Equivalent	5.6	3.8	6.7	-2.379***
Credit Intensity	USD		2500		

Source: Author Computations

The descriptive statistics of the variables used in the regression models show that out of the 55.5% male headed households 62.3% had access to credit as compared to 37.7% of the 44.5% female headed households who had access to credit. Access to credit is positively collerated to education levels as the percentage of the respondents who access credit increases with level of education. Percentage without access to credit decreases with level of education. The percentage of respondents who had no access to credit was however higher at each education level than the percentage of those with access to credit. This suggests that there are other factors that affect access to credit irrespective of literacy level. 62.5% of the sample was affiliated to savings cooperative and of that percentage only 35.1% had access to formal

credit. This indicates that farmers affiliated to savings and credit cooperatives demand less credit from formal lenders because they have a local, member owned facility. The next subsection presents the empirical results and discussion on the determinants of farmer participation and intensity of participation i.e. credit intensity.

4.5.2. Determinants of farmer participation and credit intensity

The Probit and Tobit model after the diagnostic test proved no significant intercorrelation among the independent variables. The regression models were estimated and the results are presented in table 3.3. Both models are significant, [Wald Test (P<0.01)]. This indicates a high explanatory power of the joint association of factors influencing whether or not to participate in credit markets and intensity of participation once they decide to participate. The log likelihood is negative suggesting endogeneity between the farmer's decision to participate in a credit market and the intensity or degree of participation. The use of the double huddle model is therefore justified.

The following discussion and policy recommendations are based on the double huddle model results involving the Probit and Tobit regression models. Table 4-4 gives the regression results of the determinants of farmers participation and intensity of participation in rural credit markets in Zimbabwe.

Table 4-4: Regression results of determinants of farmers participation and credit intensity in Zimbabwe

	Probit Participation in Credit Markets			Tobit Intensity of participation		
		Marginal effects			Marginal effects	
Explanatory Variables	$\partial y/\partial x$	Std Err.	z-value	$\partial y/\partial x$	Std Err.	z-value
Constant	2.83194	1.8938	-7.12	17.31546	0.4817	4.31
Age of the household	3.029938**	2.469262	3.54	-0.999318**	0.000552	-0.12

head						
Gender of household head	-0.999318	.0005555	1.76	-0.352186	0.3552467	-0.10
Level of education	6.77435*	8.624033	1.38	0.276765***	0.3054876	0.91
Family Labour endowment	-0.951175	0.321505	-1.87	-1.430788**	0.6275025	2.28
Farm Size	0.351216**	0.412161	2.13	0.3735106*	0.293959	1.27
Total Livestock ownership	0.446165	0.219526	1.24	1.57070904	1.452236	1.08
Farmer saves money	1.939624*	0.969099	3.04	2.165225**	1.601683	0.37
Farmer perception of loan repayment period	0.7084451*	0.161412	2.66			
Farmers perception of lending procedures	0.875469***	0.352186	1.78	0.682553	0.08197	0.25
Interest at borrowing				-0.982043***	1.33218	1.2
Opportunity to take a second loan	0.931265**	0.610023	2.08			
Physical distance of farmer from financial market	-1.301572*	5.275281	1.17			
Attitude towards Risk	0.784528*	0.0734542	0.72	5.951626***	2.399915	-2.46

Extension Contact	0.951632**	0.561231	1.21	6.77435*	8.624033	1.5
Experience in credit use	1.283528**	4.361942	2.75	0.951175	0.32415	-0.16
Membership of the Farmer	1.632951**	0.831823	1.34	0.782351	0.041982	0.81
Pseudo R^2	0.2545			0.5213		
Number of Observations			200			200
Log likelihood	-102.4413			-98.379		
Wald Test			P<0.01			P<0.01

Source: Author computation
Note: ***1% level of significance, **5% level of significance and *10% level of significance.

Estimates from the Probit model suggest that the farmer's decision to participate and access agricultural financial markets is determined by a number of factors including age of household head, the farmer's level of education, the farm size, individual savings, farmer's perception of loan repayment period and lending procedures, contact with extension personnel, experience in credit use and membership to a savings and credit member owned institution. The coefficients for these variables are statistically significant at 1%, 5% and 19% level of significance. The results from the second huddle (Tobit model) show that once the farmer has decided to participate and access agricultural financial markets their intensity of participation is dependent upon level of education, family labour endowment, and the interest charged at borrowing, their attitude towards risk and the extension support at their disposal.

The results show that an increase in age increases the probability of a farmer

to participate in credit markets. Older farmers have more movable and immovable assets that can be used as collateral security than their younger counterparts and hence have better access to financial markets. The results however show that the probability of the intensity of participation as measured by the amount borrowed decreases with age. Older farmers have more farm resource endowments hence they tend to borrow less than their younger counterparts.

An increase in the education of the farmer results in increased probability to participate in financial markets. Farmers who have undergone some basic education are better able to plan and assess their cash flow deficits than illiterate farmers and are thus more likely to seek for formal credit facilities to meet cash flow bottlenecks.

An increase in farm size will result in an increase in the probability of borrowing by 35 percentage points at 5% level of significance. From this result it is expected that farmers with larger farms would need financing to accomplish their production objectives. Smaller farms can easily be self-financed from the farmers' savings. The probability of intensifying of participation as measured by amount borrowed increases with farm size by 37 percentage points. It is logical to argue that a lager farm would require more financial resources hence this result.

An increase in farmers' savings increases the probability of borrowing from the financial markets. This is as expected in accordance with Vogel, (1984b) that savings with an institution improves opportunities for reciprocity, meaning that individuals will be attracted to save with an institution if it means that they will be able to access credit at a later date.

Favourable perception of lending procedures results in increase in the probability to participate and borrow from the financial market by 88 percentage points. There is therefore a significant relationship between perceptions towards loans and the borrowing of agricultural loans. As posited

by Boiij *et al,* (2012) people may or may not make use of available funding possibilities because of transaction costs arising for example from complexity of the application process.

The results show that the repayment period has an effect on farmers' choice to borrow. An increase in the repayment period increases the probability of a farmer to borrow by 71 percentage points. This means that longer loan tenure and easy loan repayment terms incentivise farmers to choose to borrow from the financial market.

Some farmers may choose whether or not to participate in agricultural financial markets dependent on the easiness or difficulty of the loan application procedures. The loan terms and conditions including the interest rate will also determine the intensity of participation. This is collaborated by the result, which shows that a positive perception of the repayment period will increase the probability of borrowing from the financial markets. The results also show that an increase in distance from financial markets will decrease the probability of participation in the market by 130 percentage points. As expected an increase in interest rate will result in decrease in the probability of borrowing more from the financial market by 98 percentage points.

The results show that increased contact with extension workers increases the probability of participation in financial markets by 95% points. It also increases their intensity of participation as measured by amount borrowed. In Zimbabwe, one of the major challenges facing smallholder communal farmers is poor productivity in terms of yield per unit area and in terms of quality. This finding conforms to that of Diagne and Zeller (2001). Contact with extension personnel will improve their yield both in terms of quantity and quality and improve profitability, which in turn will encourage participation in credit markets as the prospects of being able to repay loans, are improved.

A positive attitude towards risk increases the probability of participating and borrowing from the financial markets by 78 percentage points. The probability

of intensifying participation by borrowing more is also increased. Farmers are likely to limit their exposure to the risk of failing to repay by reducing their intensity of participation if their yields remain low, below the genetic yield potential of the crop or livestock enterprises and the environmental potential of their agro-ecological regions. It can be inferred from the empirical results that poor contact with extension services results in poor production efficiency, i.e. inability to maximise on the genetic potential of crops and livestock, and on agro-ecological endowments, and reduces the demand for credit and limits access to agricultural finance markets.

The empirical results show that farmers with higher levels of education enhances the probability of intensifying participation in agricultural financial markets by borrowing more. Farmers who are more educated are more likely to make informed decisions and take calculated risks. They are more likely to insure their enterprises against multiple perils and hence shift the risk to the insurance service provider.

The major risk faced by communal farmers in Zimbabwe is that of crop failure due to weather variability and climate change related extreme weather events. Over 95% of communal farmers rely on rain-fed farming hence their exposure to weather and climate risk is very high (Makadho *et al*, 2006). It therefore follows that only high risk takers will decide to take a loan under these circumstances. The risk does not only manifest itself in crop or livestock failure but also in the farmer losing assets due to foreclosure on the assets that would have been pledged as collateral security. Farmer perception to risk is therefore a strong determinant of both the decision to participate in credit markets and the intensity of participation.

The results show that increase in distance from the financial markets will result in 30-percentage points reduction in the probability to participate. Farmers in remote communal areas that are distant from the formal credit markets are likely not to borrow from these financial markets. This may be attributed to the hustles and costs of travelling to distant urban centres to

arrange for the loans. This concurs with finding from Quoc *et al.* (2012). More often than not, more than one trip to these distant financial markets will be required.

The probability of farmers who are members of a producer or savings group applying for formal credit is higher than those who are not. This may be because farming networks and associations facilitate sharing of information about credit opportunities thus lowering costs of search for credit sources and assist farmers who often are not familiar with application procedures. This concurs with findings from Okten and Osili (2004), Kimuyu and Omiti (2000), and Quoc et al.(2012).

An increase in interest rate at time of borrowing results in the probability of decreasing the amount borrowed decreasing by 98 percentage points. Interest rate is the cost of money borrowed and as such if it is too high farmers who decide to borrow will opt to decrease the amount borrowed to align it to their capacity to repay the loan.

4.4. Summary

The objective of this chapter was to identify the determinants of access to agricultural financial markets for smallholder farmers in Zimbabwe and to recommend policy options for closing the rural agricultural finance gap. The empirical results from the demand side for credit show that older farmer are likely to have assets to pledge as collateral security are more likely to participate and access formal agricultural credit. Extension services improve crop and livestock productivity and such farmers with extension contact are likely to choose to access and increase their intensity of participation in credit markets.

From the results it can be inferred that farmers perception of risk affects access to agricultural financial markets. Rain-fed agriculture has a high risk of

crop and livestock failure due to variability and unpredictability in weather patterns and climate change related extreme weather events including droughts and floods. Only those farmers who have a high risk appetite access and participate in credit markets at the risk of losing their assets to financial service providers in the event that they call on the collateral security assets.

The results also showed that farmers in remote areas that are distant from the formal financial markets have less access to credit facilities.

Key policy interventions that can improve access to agricultural financial markets include improving extension contact in order to improve crop and livestock productivity, which in turn will improve farmers' profitability and ability to repay farm credit. Infrastructure development including the development of service centre growth points in remote areas can attract financial service providers to decentralise and reduce the distance to the financial services markets, transaction costs and interest rates.

CHAPTER 5.   DETERMINANTS   OF   CREDIT RATIONING   FOR   SMALLHOLDER   FARMERS: EMPIRICAL EVIDENCE FROM ZIMBABWE

5.1. Introduction

This chapter compliments the preceding chapter in analysing the cause of the rural finance gap by an empirical study of the determinants of credit rationing. The chapter presents the empirical methods results and discussion of the determinants of credit rationing for smallholder farmers in Zimbabwe.   The chapter is structured as follows; Section 5.2 outlines the methodology comprising the theoretical and analytical framework, the empirical model and data collection. Section 5.3 is the results and discussion and section 5.4 concludes the chapter with a summary of the findings.

5.2 Methodology

5.2.1. Theoretical Framework For Credit Rationing

Jaffee (1971) defined credit rationing as the difference between the quantity of loans demanded and loans supplied at the going interest rate. Padmanabhan (1981) conceptualised credit rationing as a scenario where borrowers receive a smaller amount of loan than they applied for at a given interest rate.

Credit rationing manifests when those who need credit do not get it in adequate quantity (Jansson *et al.*, 2013). Jaffee and Russel (1976) in their analysis of the credit market shows that credit rationing arise because of adverse selection and moral hazard. Subsequently, Stiglitz and Weiss (1981) posited that credit rationing refers to circumstances in which either (1) there is discrimination among identical loan applicants in terms of receiving the loans. Others receive and others do not, and for the rejected applicants the bank would still reject their applications even if they offered to pay a higher interest rate, or (2) there are identifiable groups of individuals in the population who, with a given supply of credit, are unable to obtain loans at any interest rate

even though they would with a larger supply of credit.

Jaffee and Stiglitz (1990) broaden the classification and identify three aspects of credit rationing:

i) situations in which a borrower may receive a loan of a smaller amount than desired, ii) some individuals cannot borrow at the interest rate they consider appropriate and iii) a borrower may be denied credit when a lender thinks it may not be able to obtain its required return at any interest rate.

The fundamental setback is that of information asymmetry, resulting in credit rationing either in the form of complete rejection of loan applications or granting smaller amounts than applied for. Financial services providers need to ascertain the risk profile of the applicant (adverse selection) and ensure adherence to the agreed terms and conditions in order to guarantee repayment (moral hazard). They need a monitoring and evaluation system to safeguard repayment (enforcement) or put in place an institutional framework that entices prompt repayments (Olomola 1996; Ghatak and Guinnane 1999).

The theoretical justification for credit rationing has been subject to empirical studies (Guirkinger and Boucher 2008; Boucher, Carter, and Guirkinger 2008; Boucher, Guirkinger, and Trivelli 2009; Khantachavana et al . 2012). To that end, Guirkinger and Boucher (2008) postulated a model that shows that collateral requirements in response to asymmetric information can cause not only quantity rationing but also risk rationing. Quantity rationing (outright rejection or lending less than the amount requested) originates from supply-side lender collateral requirements and borrowers' inability to meet those collateral requirements. Risk rationing arises in situations in which potential borrowers would not borrow even if they could because of the risk of being indebted and of losing the assets pledged as collateral (Boucher and Guirkinger 2008).

Boucher, and Guirkinger (2008) made clear distinctions between quantity

rationing, risk rationing, and price rationing. Their model is based on asymmetric information that leads to loans backed with high collateral, therefore farmers who default will lose substantial productive assets. Hence, farmers will self-ration and not participate in the market to preserve their productive assets. In the model, both financial and productive wealth can be used as collateral. The scholars illustrate that an increase in financial or productive wealth tends to relax quantity rationing. As regards risk rationing, they postulate that the financially wealthy will be risk rationed. They also argue that there is a relationship between risk rationing and productive wealth. The land wealthy will choose to participate in the credit market and fully exploit their productive asset (land).

Despite the relevance of Boucher, Carter, and Guirkinger (2008)'s theoretical framework to the understanding of agricultural credit rationing in developing countries, it has only been applied to small-scale farmers in China, Mexico and Nigeria (Khantachavana, Turvey, and Kong 2011; Khantachavana et al. 2012; Olomola, 2014). This study borrows from the authors and applies this theoretical framework to Zimbabwe.

The present analysis is in line with the theoretical framework of Boucher, et al 2008, in classifying credit rationing into three categories; (1) quantity rationed or supply-side-constrained farmers; (2) risk-rationed farmers, who do not face a binding limit and therefore do not have excess demand for credit (the only limiting constraint comes from the demand side); and (3) price-rationed or unconstrained farmers, who may either borrow or not and are satisfied with the loan amount at the price offered.

5.2.2. Analytical Framework for credit rationing

In the econometric analysis, credit rationing is described by a series of dichotomous variables defining the possible categories of rationing. Typically, the unobserved latent counterpart of the observed variable captured in the survey characterizes farmers' rationing status, and it can be expressed implicitly as follows.

$$y_i^* = x_i'\beta_i + \varepsilon_i \qquad\qquad (5.1)$$

The observed variable is y_i which equals 1 if $y_i^* > 0$, in which case a farmer belongs to a particular rationing category, and 0 otherwise. x_i is a vector of explanatory variables , β_i represents coefficients to be estimated in the model , and ε_i represents the error term. Three aspects of credit rationing are modelled in the analysis: quantity rationing, risk rationing, and price rationing. The equations for the three models are expressed as follows.

$$y_{1i} = a_i x_i + \varepsilon_i, \qquad\qquad (5.2)$$

$$y_{2i} = \beta_i x_i + \mu_i, \qquad\qquad (5.3)$$

$$y_{3i} = \gamma_i x_i + v_i, \qquad\qquad (5.4)$$

Where y_{1i} is a dichotomous variable with a value of unity for a quantity-rationed farmer *i* and 0 otherwise. In the same vein, y_{2i} has a value of unity for a risk-rationed farmer *i* and 0 otherwise, while y_{3i} has a value of unity for a price-rationed farmer *i* and 0 otherwise. x_i represents a vector of explanatory variables; $\alpha_i, \beta_i,$ and γ_i and are coefficients to be estimated; and $e_i, \mu_i,$ and v_i are random error terms.

5.2.3. Explanatory Variables for Credit Rationing

The explanatory variables included in the model are farm size, household size, farming experience, share of farm income in total income, nonfarm income, educational attainment, project proposal, gender, marital status, borrowing status, and location of the farmers. All the explanatory variables are assumed to be exogenous or predetermined at the time of loan application.

The choice of explanatory variables is based on considerations that the presence of credit rationing is determined both by supply and demand; thus, explanatory variables should also include observable characteristics that guide lenders' decisions. This is particularly important for factors such as collateral availability or the reputation of the borrower, which are likely to mitigate or worsen the effects of asymmetric information. Moreover,

consumption choices of household members should also be considered, as they are equally likely to affect the perceived rationing status of the household. The included variables reflect these considerations and play different roles in accordance with our *apriori* expectations. Land (farm size) is taken as an indicator of collateralizable wealth. Experience of the farmer is measured as years of farming. Credit rationing is expected to be inversely related to farming experience. The years of schooling represent educational attainment. It is expected that the higher the educational attainment, the lower will be the probability of being credit rationed. The effect of household size is ambiguous, as it is possible that a higher number of household members may both increase (via increased consumption) and decrease (via generation of other earned income) the liquidity shortage. Marital status is an indicator of the reputation of the farmer. In the reckoning of lenders, a married farmer is held in higher esteem than one who is single. This social status, in addition to the economic benefits that may be conferred on farmers by being married, is expected to make it less likely for married farmers to be credit rationed than their unmarried counterparts.

Arising from contemporary theoretical literature on credit rationing among small-scale farmers in the context of developing countries by Boucher, Carter, and Guirkinger, (2008) and Olomola & Gyimah-Brempong, (2014) our analysis is guided by two working hypotheses: (1) quantity rationing is decreasing in financial wealth and productive wealth and (2) risk rationing is decreasing in financial wealth and productive wealth. Financial wealth is represented by nonfarm income, share of farm income in total income, while productive wealth is represented mainly by farm size and other related variables such as education, and farming experience.

5.2.4. Empirical Model Specification

The Seemingly Unrelated Regression (SUR) model was employed in the analysis. This approach has been used recently in similar studies (Khantachavana , Turvey, and Kong 2011; Doherty , Dee, and O'Neill 2012;

Korosteleva , Isachenkova, and Rodionova 2012; Nilakantan et al . 2013).

Formal lenders have a tendency to discriminate against small-scale farmers in their loan applications. This implies that the socioeconomic characteristics of the small-scale farmers will influence their rationing status and hence they will be included in the model. The variables that affect quantity rationing can also affect risk rationing and price rationing, although the effects should be different. The model will be characterized by cross-equation correlation of error terms, hence the justification to use of Seemingly Unrelated Regression. Estimating each model as a separate equation will lead to inefficient estimates (Greene, 2003).

5.2.5. Data Collection

A questionnaire was designed to collect primary data from the sampled 200 farmers. The sample selected for chapter 4 (see table 4-2) was used for this study. Trained enumerators administered the questionnaire on the sample of smallholder farmers. The questionnaire collected demographic and socioeconomic data. Data on farm size, household size, farming experience, farm income, nonfarm income, savings, educational attainment, gender of household head, age of household head, experience, business plan and number of livestock Units (LUs) of the farmers was collected. Data was edited and coded to ensure accuracy, validity, uniformity, consistency and completeness.

The questionnaire was designed to identify farmers' credit-rationing status in terms of the three categories (quantity, risk and price rationed). The research tool had questions that made it possible to infer respondents' credit rationing category. Khantachavana, Turvey, & Kong (2011) and Olomola & Gymah-Brempong (2014)'s definition of the three categories of rationed farmers was used. For the farmers who applied for a loan from formal institutions, price-rationed farmers are those who borrowed and were happy with the amount they received. An applicant who was denied a loan is quantity rationed. A

farmer who received a loan lower than applied for and therefore not happy is risk rationed. Farmers who did not apply for a loan were also covered in the survey. An inquiry into the reasons for not borrowing reveals three basic reasons: first, some people did not apply due to the possibility and knowledge that their applications would be rejected (quantity rationed); second, some people did not apply due to the fear of losing collateral (risk rationed); and third, some people had enough money and no need to borrow (price rationed). On the basis of these definitions, the farmers in the sample were classified into the three credit-rationed categories.

5.3. Result And Discussion

5.3.1. Descriptive Analysis

The study analysed data collected from 950 small holder farmers who submitted participated in the study, of which 60% of the respondents are female and 40% of them are male.

The descriptive statistics of the variable used in the empirical study are presented in table 5-1.

Table 5-1: Descriptive statistics of variables used in the SUR model.

CATEGORICAL VARIABLES						
[A] VARIABLE	[B] UNIT	[C] % of TR N=950	[D] % of C - QR N=389	[E] % of C - PR N=324	[F] % of C – RR N = 237	[G] χ^2 – value
Gender of household head	Male	40	46.5	54.2	41.9	4.851
	Female	60	53.5	45.8	58.1	
Education Attained	Illiterate	4	0	0	0	
	Adult Education	22.5	16.9	16.9	11.6	
	Secondary Education	45.6	23.9	13.6	37.2	6.913**
	College/Vocation	20.8	33.8	30.5	23.3	

	University	6.9	25.4	39	28	
Business Plan	Yes	75.1	66.2	28.8	44.2	3.872*
	No	24.9	4.2	5.1	2.3	
Continuous Variable						
Variable	**Unit**	**Mean TR**	**Mean QR**	**Mean PR**	**Mean RR**	**t-value**
Age of the household head	Years	49	47	45	43	1.384
Farm Size	Hectares	6	8	5	7	2.793**
Farm Income	$	2837.83	1207	1378.5	1622.8	3.072***
Non-Farm Income	$	837.4	863.5	975	1087.5	2.341*
Livestock Unit	Units	4.8	5.4	4.3	6.2	2.265*
Experience	Years	9	7	9	13	2.811*

Source: Research finding, 2018
Note: TR –Total Response, QR –Quantity Rationed, PR – Price Rationed, RR – Risk Rationed

The sample of interviewed farmers was highly literate with 45.6% having obtained some secondary education, 20.8% college or vocational education and 6.9% having obtained some university education. 75.1% had a farm business plan of which 66.2% were quantity rationed, 28.8% risk rationed and 44.2% price rationed. The average age of the household was 49 years. The average farm size of the interviewed farmers was 6 ha with an average ownership of livestock at 4.8 livestock units. Average on farm income for the interviewed farmers was US$2837.83. The average farm income for the quantity rationed was US$1207, for the risk rationed US$1378.50 and for the price rationed it was US$1622.80. The empirical results and discussion of the determinants of credit rationing are presented in the next subsection.

5.3.2   Determinants of Credit rationing

The results of the estimated SUR model are presented in table 5-2 and 5-3 follwed by a dicussion of the results

Table 5-2: Seemingly Unrelated Regression Results

Variable	Estimated Model		
	Quantity Rationed	Risk Rationed	Price Rationed
Constant Value	-0.511753	-8.804491**	1.92315
Age	0.015358	-0.002454**	0.001186
Gender	0.119211	0.027226*	-0.062633**
Education attainment	0.266972***	-0.335224*	0.344597**
Livestock Unit	-0.036664*	0.074115**	0.006042*
Farm Size	0.141545**	-0.258387	0.129483
On farm Sales	0.002488**	-0.001607	0.079681**
Non-Farm Income	-0.000337***	0.000715	0.00011**
Distance	2.595884	-3.840726	-0.34038
Farming Experience	-0.006446**	0.007221	0.01199
Business Proposal	-0.028459**	-0.0029528*	-0.018547*
No. of observations	173		
R – squared	0.7281	0.7296	0.8175
Prob	0.0000	0.0000	0.0000
Breusch-Pagan test of independence:	Chi^2 (3) = 1.1394 Prob > chi^2 = 0.000		

Source: Author computation

Note: ***1% level of significance, **5% level of significance and *10% level of significance.

Table 5-3:Correlation Matrix Table

Variable	Quantity Rationed	Risk Rationed	Price Rationed
Quantity Rationed	1.0000		
Risk Rationed	0.3011	1.0000	
Price Rationed	-0.0628	-0.1996	1.0000

A Breusch-Pagan test of the independence of the error terms of each of the three seemingly unrelated regression equations shows that the three credit rationing models are not independent. This is confirmed by the non-zero cross correlation coefficients of the error terms of the estimated equations (table 5-3). The use of Seemingly Unrelated Regression is therefore as a better estimation technique than estimating each of the equations separately.

Age, gender, distance to formal financial service providers and farming experience have no statistically significant effect on the probability that farmers will be quantity rationed. This is judged from the fact that the coefficients of these variables are not significant in the estimated equation.

With regard to risk rationing, we fail to accept the hypothesis that risk rationing is decreasing in financial wealth. This is because the coefficients of the key financial wealth variables i.e. on-farm sales and non-farm income are statistically insignificant for the risk rationed farmers. We also fail to accept the hypothesis that risk rationing is decreasing in productive wealth in terms of farm size since the coefficient for farm size is statistically insignificant. However the hypothesis is accepted with regards to productive wealth in terms of education level on account of the statistically significant and negative coefficient. The results imply that farmers with higher education have decreased probability of being risk rationed and price rationed than their counterparts with less education. The educated farmer is more discerning and chooses not to apply for the loan for fear of loosing assets pledged as collateral security. The same educated farmers have a higher probability of being price rationed in that they are more likely to have enough money and therefore choose not to borrow.

As regards price rationing 6 out of 10 variables included in the model turn out to be significant determinants. Contrary to the findings by Olomola and Gyimah-Brempong (2014), price rationing is found to be increasing in financial wealth, judging by the positive and significant coefficients of non-farm income and farm income. In line with the questions asked during the survey to categorise farmers the financially wealthy farmers i.e. those with high on farm and off farm incomes, had a higher probability of not applying for the loan (price rationed) because they probably had enough own resources to plough back into their farming activities. The higher the financial wealth the higher the probability of being price rationed.

We find that male farmers have a higher probability of being price rationed than female farmers. Also a farmer with a good business proposal has lower probability of being quantity, risk and price rationed judging by the negative and significant coefficients of the variable for all categories of rationing. Additionally farming experience turns out to be a significant variable that

explains quantity rationing. The coefficient is negative for quantity rationing, suggesting that the higher the farming experience, the lower the probability that the farmer will be quantity rationed. This is conceivable because an experienced farmer can be more mathematical in estimating the farm's credit requirements thereby giving the lenders confidence to advance the loan. Experienced farmers are more likely to keep historical physical and financial farm records and are more likely to prove viability of their intended projects in their loan application proposals. In the same vein the business proposal coefficients are negative for quantity, risk and price rationing. This is also possible since such proposals have lower probabilities of being credit rationed.

The analysis of credit rationing in three different categories using the SUR model shows the effects of the explanatory variables in a more critical manner and gives better discernment of the determinants of credit rationing among communal farmers. It is a better approach than would have been the case if only one category had been examined. This analytical method shows that a particular variable may have completely different effects on the three types of credit rationing. A generalization of the effects of such a variable could have produced misleading results. To illustrate this, if we look at education attainment variable, an additional year in education attainment will increase the probability of farmers being quantity rationed by 26.7 percentage points and that of being price rationed by 34.5 percentage points but reduce the probability of farmers being risk rationed by 33.5 percentage points. Some variables have a significant effect on one type of rationing but insignificant effect on the other types of credit rationing as illustrated in the table.

5.4. Summary

This chapter sought to employ an empirical analytical method to investigate the determinants of credit rationing among smallholder farmers in Zimbabwe. Based on a theoretical framework that categorise credit rationing into quantity, risk and price rationing and following the approach by Olomola & Gyimah-

Bremgpong (2014) the Seemingly Unrelated Regression (SUR) model was used to analyse the effect of a set of explanatory variables on the three credit rationing categories. Data was collected from the random sample of 173 communal farmers in Mutasa and Chimanimani districts of Manicaland province using a household questionnaire (see appendix). From the results we realise that communal smallholder farmers in Zimbabwe face significant levels of credit rationing in various forms. Credit availability is a critical issue for farmers in Zimbabwe. This is compounded by the fact that suppliers will demand collateral security, which smallholder farmers do not have. There is therefore need to diversify agricultural financing channels through innovative financing mechanisms for smallholder farmers. Such channels could include value chain financing mechanisms encompassing trade credit, (i.e. credit from input suppliers and off takers) contract farming, out grower schemes, warehouse receipt finance, loan guarantees and lease financing.

A key policy recommendation is for government to facilitate these alternative forms of agricultural financing through enacting appropriate enabling legislation that facilitate ease of doing business.

CHAPTER 6.CONCLUSIONS, RECOMMENDATIONS AND OUTLOOK

6.1. Introduction

The purpose of this thesis as stated in chapter 1 was to assess the options for narrowing the rural agricultural financing gap in Zimbabwe, to achieve this goal the thesis researches the determinants of access to agricultural financial markets for smallholder farmers in Zimbabwe. It also sought to assess credit rationing as a result of the demand for loans exceeding supply. Pursuant to this, the study investigated the determinants of credit rationing among smallholder farmers in Zimbabwe through quantitative research methods. To understand the background and put the research into context an in-depth literature review was done and captured in chapter 2 and 3. Chapters 4 and 5 covered the empirical research using data collected from randomly selected samples of smallholder communal farmers who reside in purposively selected wards in Zimbabwe. The data was analysed using the Stata 13.

Rutten and Botto (2014) inspired this thesis. The authors, in their reader titled "Revolutionizing Finance for agro-value chains", prepared for the Brussels Rural Development Briefings explain how tailoring the provision of financial services for small-scale farmers remains challenging for developing countries. On pp 6 of the Briefing they state that;

> " Conventional thinking is that financing agriculture has high transaction costs, low returns on investment and is risky business, collateral is a major constraint to access finance from financial service provider due to land tenure restrictions. Financial service providers may also see high risks because they lack understanding of the agricultural sector and food markets and have no way to evaluate the risks in agricultural value chains. …….. Commercial banks prefer to provide loans to well established large businesses, rather than numerous small loans to micro-entrepreneurs. The result is a serious and long lasting rural finance gap that keeps the economic potential of agriculture underused"

The aim of this study was to identify sustainable means of addressing the rural and agricultural finance gap for Zimbabwe. The specific objectives were to i) to identify and examine the determinants of access to agricultural financial markets for smallholder farmers in Zimbabwe, and ii) to assess credit rationing as a result of the demand for loans exceeding the supply, by identifying and examining the determinants of credit rationing among smallholder farmers in Zimbabwe. Objective (iii) would draw from objectives (i) and (ii) to recommend policy options and financing models to close the rural agricultural finance gap for sustainable and smallholder inclusive rural financing for agricultural value chains in Zimbabwe. The objectives were addressed by employing quantitative empirical econometric models.

In Chapter 4 the double huddle econometric model was applied to analyse the determinants for the decision to participate in formal financial markets and the intensity of participation once the decision to participate has been made. The double-hurdle model originally devised by Cragg (1971) was used (Rutten & Boto, 2014) (Mukwereza & Manzungu, 2003) (Helms & Pearce, 2001). The model assumes that smallholder farmers make two sequential or independent decisions with regard to acquire credit each of which each is determined by a different set of explanatory variables. The model considers the possibility of zero outcomes in the second-hurdle arising from the individuals' deliberate choices or random circumstances. Chapter 5 employs the Seemingly Unrelated Regression (SUR) model, which was originally proposed by Zeller (1962). Based on a theoretical framework that categorise credit rationing into quantity, risk and price rationing the approach by Olomola & Gyimah-Brengpong (2014) was used. The SUR model was used to analyse the effect of a set of explanatory variables on the three credit rationing categories. The findings from chapter 5 are important for policy given that they inform the natural behaviour of lenders to ration credit and hence existing alternative and innovation financing mechanisms must be employed within an enabling policy environment to address the rural agricultural finance gap.

The aim of this final chapter is to present the main findings of this thesis and provide policy recommendations for sustainable rural agricultural financing that promotes financial inclusion for the smallholder farmers in Zimbabwe. Section 6.2 gives a summary of the conclusions of the thesis' findings and section 6.3, the key policy propositions. Section 6.4 spells out the limitations of the study. The chapter is concluded in section 6.5 in which areas for further study are proposed.

6.2   Conclusions

In Chapter 1 and following the research purpose typology provided by Newman, Ridenour et al. (2003), it was stated that the purposes of this thesis was; 'to add to the knowledge base', 'to have a personal, social, or institutional impact', and 'to inform constituencies and to examine the past'. The contribution of this thesis to the category of literature it addresses is mainly empirical. The theoretical frameworks used in all the empirical studies in this thesis are not new to the literature; however, studies showing their applications in developing countries in general and to the smallholder farm households of Zimbabwe in particular are generally new. Hence, by taking the different theoretical concepts used in this thesis to empirical tests, this study has tried to fill the empirical void particularly for Zimbabwe.

6.2.1 Determinants of access to and intensity of participation in agricultural financial markets for smallholder farmers in Zimbabwe

The first specific objective was to identify and examine the determinants of access to agricultural financial markets for smallholder farmers in Zimbabwe. The identification and examination of the determinants of access to and intensity of participation in financial markets by smallholder farmers is not new to the literature, both theoretically and empirically. However, such a study in Zimbabwe has not been widely investigated. This study thus has a unique contribution to this body of knowledge.

Cross sectional data was collected from purposively selected farming regions

and random samples of smallholder farmers in Zimbabwe. The findings from chapter 3 show that farmer's decision to participate and access agricultural financial markets is determined by a number of factors including age of household head, the farmer's level of education, the farm size, individual savings, farmer's perception of loan repayment period and lending procedures, contact with extension personnel, experience in credit use and membership to a savings and credit member owned institution. Older farmer are likely to have assets to pledge as collateral security and therefore are more likely to participate and access formal agricultural credit. Extension services improve crop and livestock productivity and such farmers with extension contact are likely to choose to access and increase their intensity of participation in credit markets.

Farmers' perception of risk affects access to agricultural financial markets. Rain-fed agriculture has a high risk of crop and livestock failure due to climate change, variability and unpredictability in weather patterns. Increased incidences of climate change related extreme weather events including droughts and floods also increase the farmers' risk. Only those farmers who have a high risk appetite access and participate in credit markets at the risk of losing their assets to financial service providers in the event that they call on the collateral security assets when disaster strikes. The low uptake and supply of insurance services is also cause for concern.

The study also showed that farmers in remote areas that are distant from the formal financial markets have less access to credit facilities.

6.2.2. Determinants of credit rationing by formal financial service providers for smallholder farmers in Zimbabwe.

The second specific objective was to identify and examine the determinants of credit rationing by formal financial service providers for smallholder farmers in Zimbabwe. As with the first specific objective, Whereas previous literature shows evidence of both theoretical and empirical investigation of the determinants of credit rationing in a few developing countries, there has not

been any evidence of such an investigation for Zimbabwe. Thus this study contributes to the existing body of knowledge in that regard.

The key findings from this study show that communal smallholder farmers in Zimbabwe face significant levels of credit rationing in various forms. Credit demand is in excess of supply at various interest rates. Credit availability is a critical issue for smallholder farmers in Zimbabwe. This is compounded by the fact that suppliers will demand collateral security, which the majority of smallholder farmers do not have. Quantity, price and risk rationing arise as a result of asymmetric information and the problem of moral hazard. The study showed that farmers could also ration themselves out of the financial markets due to several factors including risk of losing assets that would have been pledged as collateral security. There is therefore need to diversify agricultural financing channels through innovative financing mechanisms for smallholder farmers. Such channels could include value chain financing mechanisms encompassing trade credit, contract farming, out grower schemes, warehouse receipt finance, loan guarantees and lease financing. In addition, the formal sector needs to relax the restriction of lending for productive purpose for creditworthy smallholder farmers. This also means that more comprehensive assessment of the creditworthiness of farm households are needed.

6.3. Policy Recommendations

The third specific objective was to draw from the key findings from empirical studies in chapters 4 and 5 and give policy recommendations for sustainable agricultural financing mechanisms that can contribute to closing the agricultural finance gap.

6.3.1 Agricultural Extension and Training Strengthening

As pointed out in Chapter 4, key policy interventions that can improve access to agricultural financial markets include improving extension contact in order

to improve crop and livestock productivity, which in turn will improve farmers' profitability and ability to repay farm credit. From the same Chapter it was shown that more educated farmers have a high probability of participating in financial markets and of increased intensity of participation. The public extension service can improve the level of agricultural education for farmers.

In Zimbabwe the farmer-to-extension worker ratio is high. In the 1990s it was estimated at 800:1 (Rukuni, 2006). This ratio worsened after the 2000 Fast Track Land Reform Program (FTLRP), given the increase in the number of new farmers. Currently, most extension workers have low levels of experience and competency due to skills flight among the more experienced extension workers following economic hardships due to the 2007/8 hyperinflation. They are isolated in remote areas, and therefore they have limited access to information on market developments as basis for giving up-to-date agribusiness advice to farmers.

Government needs to enhance institutional performance of training, research and extension. The net loss due to skills flight of agricultural practitioners has considerably reduced the quality of the extension and advisory services. The government can enhance extension services institutional capacity by implementing the recommendations of the Parliament of Zimbabwe (2003), to support Agritex in the designing and implementation of crash farm production training programs especially for Model A2 resettlement farmers through sale of crop and livestock production manuals, workshops and seminars and facilitating linkages with financial managers, input dealers as well as marketers. In addition the public extension service should be capacitated through investments in renewed collaboration with private sector. National private sector capacities that are available for some of these services are underutilised.

Chapter 4 established that increased distance to the financial markets reduces the probability of both participation and intensity of participation in rural agricultural financial markets. Infrastructure development including the development of business service centres in remote areas can attract financial service providers to decentralise and reduce the distance to the financial services markets, transaction costs and interest rates. This will in turn improve both farmer participation and intensity of participation in formal financial markets.

6.3.2 Innovative Financing Mechanisms

Results from Chapter 5 show that communal smallholder farmers in Zimbabwe face significant levels of credit rationing in various forms. Credit demand is in excess of supply at various interest rates. Credit availability is a more critical issue in Zimbabwe than interest rates. The literature review in this study shows that there are a variety of alternative finance mechanisms other than the formal banking system. These are Member Owned Institutions encompassing SACCOs, ASCAs, ISALs, and Value chain financing mechanisms.

Despite the existence of the informal community based MOIs there has been a policy gap to ensure sustainability of these alternative agricultural finance mechanisms in Zimbabwe. Interventions by Mobile Network Providers, NGOs, Development partners and government have been fragmented and lacking a guiding policy framework.

6.3.3. Formulation and Implementation of Rural Finance Policy and Strategy

There is need for the Government of Zimbabwe (GoZ), to formulate and implement a Rural Finance Policy and Strategy to address the access and credit rationing challenges identified in chapters 4 and 5. To that end, the policy focus at the macro level should be encouragement of market based approaches to rural finance provision, a supportive institutional environment

that supports rural finance provision and a supportive regulatory and legislative framework to support the institutional framework.

At the Meso level, there is need to develop financial sector infrastructure that enables broadening outreach in remote areas through establishment of effective payment systems, credit reference bureaus, warehouse receipts, collateral management and weather indexed insurance. Support the collection and dissemination of market information and skills development of community based financial institutions.

At the micro-level GoZ can promote the expansion of financial service providers into the rural areas targeting banks, insurance companies and community-based institutions. The government can support product innovation including, inter alia, warehouse receipts, commodity exchange, leasing and invoice financing. Support financial awareness and literacy through a financial education strategy.

The Zimbabwe's Ministry of Finance in collaboration with the RBZ launched a National Financial Inclusion Strategy (NFIS) in 2016 for the period 2016 to 2020. The strategy's main objective is spelt out as (pp.10);

> "..to address barriers to financial inclusion, prioritise and address the needs of special target groups which are currently underserved, through the implementation of key priority measures that will facilitate the building of robust financial infrastructures with the view to reducing the level of financial exclusion".

It is commendable that such a strategy is in place but it has not been fully implemented. The strategy covers a number of initiatives, including, the establishment of a Credit Registry System that acts a reference for the credit history of potential borrowers, a Colleteral Registry that enables potential borrowers to pledge movable farm machinery and equipment as colleteral, a Credit Guarantee Scheme to facilitate lending to disadvantaged groups without collateral, a National Financial Literacy Framework to facilitate

awareness of financial services, Innovative Financing Schemes to enable lending to marginalised groups and opening of low cost accounts with minimal and affordable requirements. The strategy is however not comprehensive in that it focuses only on the formal and completely ignores the role of the informal microfinance, member owned and other facilitated institutions in financial inclusion. There is a heavy focus on credit and very little emphasis on savings and the promotion of informal savings and credit institutions.

There is therefore a compelling argument for the formulation of a comprehensive Rural and Agricultural Policy Framework under which various strategies will be crafted.

Access to credit and intensity of participation in financial markets discussed in Chapter 4 can be enhanced by a comprehensive land tenure security policy. Credit rationing issues discussed in Chapter 5 can also be addressed through the use of land as colleteral. The lack of security of land tenure in Zimbabwe is a major concern for all stakeholders as it derails efforts to financial inclusion. The FTLR programme changed the tenure system in the resettlement areas from freehold to leasehold with all agricultural land belonging to the State. The 99 year lease that replaced title deeds has not been accepted by banks as colleteral security because of lack of transferability issues.The land cannot be bought or sold. Resultantly the land that used to have value during the pre land reform programme era has been turned into "dead capital" post land reform. Tenure security will increase credit use by farmers through greater incentives for investment, improved creditworthiness of projects and enhance collateral value of land. It will result in the creation of a land market where it would be possible for land transactions to take place between indegenous communities, resultantly, it allows land transfers from less efficient to more efficient farmers.

6.3.4. Linkages for Risk Management of community based MOIs

In order to strengthen alternative rural financing mechanisms as recommended in chapter 5 the government can create an enabling environment for linkages between informal finance service providers (SACCOs, ROSCAs, ASCAs and ISALs) and formal service providers (Banks and Insurance Companies). The motive to link up with formal finance service providers is to mitigate risks faced by MOIs and to provide technology transfer.

Credit risk as a result of defaulting borrowers can arise in MOIs. This risk may increase when MOIs are federated or linked to MFIs. To mitigate this risk financial education needs to be enhanced for members. Liquidity risk arises as a result of not enough funds to meet cash flow needs in the early months due to more members wanting to borrow and the demand for loans is high or overflow of money in the last months as a result of not borrowing but only repaying loans. MOIs can benefit from external cash injections during liquidity shortage periods. Excess liquidity can be safely deposited in mobile banking facilities offered by the formal institution to which the MOIs are linked. In linking MOIs to formal financial institutions the principles of self-management and autonomy of the MOIs should be respected. Before linking up with formal financial sector, MOIs must show that there is need. Federating MOIs provides a business case for formal finance institutions to broaden financial inclusion to more remote rural areas.

6.4 Limitations of the study

This study employed a two stage sampling technique starting with purposive sampling of the wards followed by random sampling of the farmer respondents. Purposive samples, regardless of the type, can have high researcher bias. Purposive sampling is based on the judgement of the researcher and is prone to possible researcher biases. This method of sampling is however useful when such judgements are not ill conceived or poorly considered. Judgements must be based on clear criteria, which this study attempted to do as explained in chapter 4. The non-probability nature of

sample selection in purposive sampling makes it difficult to defend the representativeness of the sample to achieve theoretical, analytical or logical generalisation to the population.

Smallholder farmers represent about 60% of farmers in Zimbabwe. It is acknowledged that the sample size was small even though the conclusion from the study was drawn from empirical estimations. The reason for a small sample was to contain the costs of the study within a very modest budget. Despite these limitations important insights can still be drawn from this study and can form the basis for more rigorous studies of this subject matter.

6.5. Recommendations for further research

This study focused on smallholder farmers in Zimbabwe. A more systems approach to the study could be employed to also sample value chain players and the whole financial ecosystem to better understand the agricultural finance gap in Zimbabwe. This gives opportunities for further research using the current study's findings and recommendations as the basis.

Research Institutions, with more resources at their disposal can repeat this study with a bigger sample to be able to draw finer empirical estimations that are more representative of the population of smallholder farmers in Zimbabwe.

The current study was a cross-sectional research. The study can also be given a time dimension in order to assess the nature of the variables over time. This could give an empirical basis to appreciate seasonal variations in a year, variation between years and changes in trends due to environmental factors in the variables measured. Credit demand and supply can change over time due to changes in the social, economic, political, environmental, technical and legal circumstances. The current study did not use longitudinal/panel data, due to budget constraints to collect such type of data.

There is opportunity for further research in order to generate a longitudinal dataset and use econometric analysis to further interrogate the specific objectives of the current study.

Zimbabwe is diverse in terms of agro-ecological, socioeconomic, cultural and religious features. Due to this diversity, policies should be devolved to suit specific regional circumstances. One-size fits all policy approaches should be avoided. In this context, a study limited to a certain area might not sufficiently explain the circumstances of other areas. Therefore, a possible extension of this study is to replicate it using purposive sapling techniques based on different socioeconomic settings to allow explanation of variations and similarities among different locations. This way the policy recommendations of this study can be enhanced.

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Appendix 1: Access and intensity of Participation in Formal financial Markets Questionnaire 01/2019

Faculty of Natural and Agricultural sciences

Centre for Sustainable Agriculture, Rural Development & Extension

Farm Household Questionnaire:

Note to interviewers: *This questionnaire is targeted at all sampled communal farmer households*

Note to respondents: The information captured in this questionnaire is strictly confidential and will be used for research purposes at the University of the Free State to inform stakeholders on access and intensity of participation of smallholder farmers in rural financial markets. Participation in the survey is voluntary and respondents are free to withdraw from the study at any time if they so wish.

For further information, please contact: Dr Douglas Ncube (Research Supervisor), E-mail: douglas.ncube@gmail.com, Tel: (+263 774555972)

Name of Enumerator

----

1. **Date completed**

_____/_____/_____

2. **Name of farmer (optional)**

_____

Section 1: Household Demographic Characteristics

1.   Gender?

(a)	Male	1
(b)	Female	0

2.   Age of respondent

Number of Years

3.   What is your level of education?

(a)	Illiterate	1
(b)	Adult education	2
(c)	Primary	3
(d)	Secondary level	4
(f)	High School (Form 5-6)	5
(g)	College/Vocational	6
(h)	University	7

	8
	9
	10

4.   Do you own arable land

(a)	Yes	1
(b)	No	0

	11
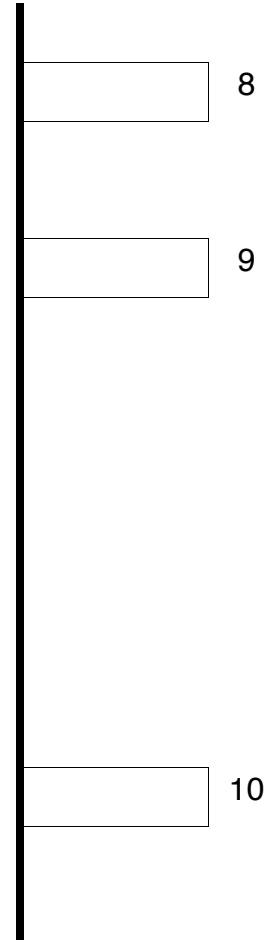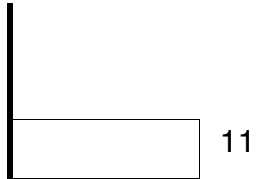
5.   What is the size of your farm Size?

(c) farm size in hectares
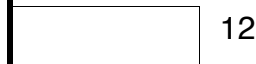
	12

6.   what is the highest level of your agricultural training?

(a)	Not formally trained	1
(b)	Master farmer certificate	2
(c)	Certificate	3
(d)	Diploma	4
(e)	Degree	5

	13

7.   Occupation

(a)	Farmer	1
(b)	Wage Employed	2
©	Self Employed	3
(d)	Contract employed	4
(e)	Unemployed	5

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Section B Household Asset Ownership

1. Livestock

Livestock	Cattle =0.7 LU/beast
Owned	Sheep/Goats =0.1 LU/animal
	Pigs=0.2 LU/pig
	Chicken =0.01 LU/bird

Total LUs

| | 15 |

2. On farm

Income

Livestock

sales

(a) less than $100	1
(b) $101 – $500	2
c) $501- $1000	3
(d) $1001 -$1500	4
(e) $1501-$2000	5
(f) More than $2000	6

Crop

sales

(a) Less than $100	1
(b) $101-$500	2
© $501-$1000	3
(d)$1001-$1500	4
(e)$1501-$2000	5

16

(f) More than 2000	6

	17

3. Which of the following implements do you own?

(a)	Mould board plough	1
(b)	Ox drawn Cultivator	2
(c)	Ox drawn Planter	3
(d)	Ox-drawn harrow	4
(e)	Ox-drawn Disk harrow	5
(f)	Ox-drawn Scotch Cart	6
(g)	Ox Drawn Water Cart	7
(h)	Other Specify	8

	18	1=own
	19	
	20	
	21	
	22	
	23	
	24	
	25	

4. Land Resources

(a)	0- 1 hectare	1
(b)	1-2 hectares	2
(c)	2-3 hectares	3
(d)	more than 3 hectares	4

5. Off Farm Income

(a)	Off farm wages	1
(b)	Remittances	2
(c)	Handicraft	3
(d)	Pension	4
(e)	Social Welfare	5

26

Rank
(descending
order)

27

28

29

6. Family Labour Endowment

Man Equivalents	Less than 9 years=0 9-15years=0.7 16-49 years=1 Above 49=0.7

Total Man Equivalents	30

Section C: Access to credit and intensity of participation

1.   Do you save some of your farm and non farm income

(a)	Yes (always/sometimes)	1
(b)	Never	0

31

2.   Are you aware of banks or other financial institutions that provide farm credit?

(a)	Yes	1
(b)	No	0

32

If no please ask question 3/ If yes go to 4

3.   What are the reasons for you unawareness of these financial services

(a)	Not aware of any formal financial service provider in my area	1
b)	The local banks do not	2

service farmers		
c) Not knowledgeable about farm credit	3	33

4.Have you ever applied for an agricultural loan from formal sources during the past 5 years

(a) Yes	1	
(b) No	0	34

If "Yes" please answer 5

5. In the last three years please state amount applied for and amount approved

1)	Amount applied for		35
	Amount approved		36
2)	Amount applied for		37
	Amount approved		38
3)	Amount applied for		39
	Amount approved		40

165

5. **Is** the repayment period suitable for Agriculture

(a) Yes	1
(b) No	0

6. **Distance to nearest formal financial service provider**

(a)	0-5km	1
(d)	More than 5km	0

7. **Does the farmer fear the risk to take a loan**

(a)	No	0
(d)	Yes	1

8. **Does the farmer has contact with extension for information**

(a)	Yes	1
(b)	No	0

41

42

43

44

9. Experience in credit use

How long have you used credit to finance farm operations	No of Years

10.   Do you belong to a farmer or financial association/union/group

(a) Yes	1
(b) No	0

46

11.   Do you have an opportunity to take a second loan

(a) No I defaulted in the last loan	1
(b) Yes because I have a clean record with the bank	0

47

12.   Have you ever received a loan from a non bank source

(a)	Yes	1
(c)	No	0

If yes answer No 13

13. Please name the non bank source from the following

(a)	Borrowed from friends/relatives/neighbors	1
(b)	Non Bank MFI	2
(c)	Contract Farming	3
(d)	Agro dealer/Input supplier	4
(e)	From MOI (ROSCAs etc)	5

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14.   From the following list of guarantees which do you think is the most suitable for you

L(a)	House properties	1
(b)	Real Estate	2
(c)	Motor Vehicles	3
(d)	Inventory	4
(e)	Livestock/crops	5
(f)	Group Collateral	6
(g)	Balance at Bank	7
(h)	Pension or salary guarantee	8

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Thank you for your time
End of Questionnaire

Appendix 2: Determinants of Credit Rationing Questionnaire 02/2019

Faculty of Natural and Agricultural sciences

Centre for Sustainable Agriculture, Rural Development & Extension

Farm Household Questionnaire:

Note to interviewers: *This questionnaire is targeted at all sampled communal farmer households*

Note to respondents: The information captured in this questionnaire is strictly confidential and will be used for research purposes at the University of the Free State to inform stakeholders on access and intensity of participation of smallholder farmers in rural financial markets. Participation in the survey is voluntary and respondents are free to withdraw from the study at any time if they so wish.

For further information, please contact: Dr Douglas Ncube (Research Supervisor), E-mail: douglas.ncube@gmail.com, Tel: (+263) 772240468

Name of Enumerator

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1. **Date completed**

_____/_____/_____

2. **Name of farmer (optional)**

_____

1-3

4-5

6-7

Section 1: Household Demographic Characteristics

1.   Gender of Household Head?

(a)	Male	1
(b)	Female	0

	8

2.   Age of respondent

Number of Years

	9

3.   What is your level of education?

(a)	Illiterate	1
(b)	Adult education	2
(c)	Primary	3
(d)	Secondary level	4
(f)	High School (Form 5-6)	5
(g)	College/Vocational	6
(h)	University	7

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4.   Do you own arable land

(a)	Yes	1
(b)	No	0

5.   What is the size of your farm Size?

Farm size in hectares

6. How many are you in this household

No of household members

7. For how many years have you been

farming

Number of years
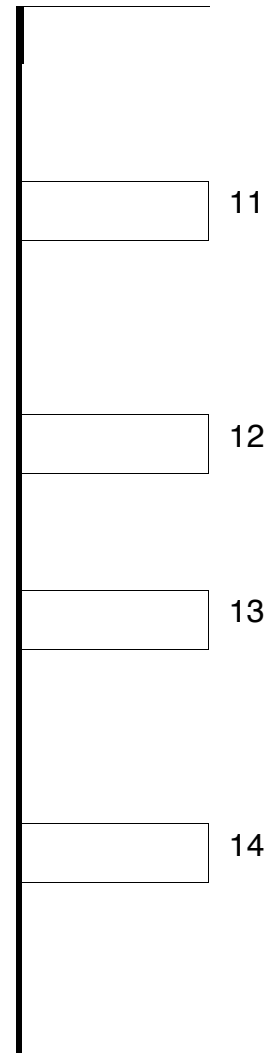
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6.   What is the highest level of your agricultural training?

(a)	Not formally trained	1
(b)	Master farmer certificate	2
(c)	Certificate	3
(d)	Diploma	4
(e)	Degree	5

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Section B Household Asset Ownership

1. Livestock

Livestock Owned	Cattle =0.7 LU/beast
	Sheep/Goats =0.1 LU/animal
	Pigs=0.2 LU/pig
	Chicken =0.01 LU/bird

Total LUs

	16

2. On farm

Income

Livestock

sales

(a) less than $100	1
(b) $101 – $500	2
c) $501- $1000	3
(d) $1001 -$1500	4
(e) $1501-$2000	5
(f) More than $2000	6

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Crop

sales

(a) Less than $100	1
(b) $101-$500	2
© $501-$1000	3
(d)$1001-$1500	4
(e)$1501-$2000	5
(f) More than 2000	6

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3.   Which of the following implements do you own?

(a)	Mould board plough	1
(b)	Ox drawn Cultivator	2
(c)	Ox drawn Planter	3
(d)	Ox-drawn harrow	4
(e)	Ox-drawn Disk harrow	5
(f)	Ox-drawn Scotch Cart	6

	19	1=own
	20	
	21	
	22	
	23	
	24	

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(g)	Ox Drawn Water Cart	7
(h)	Other Specify	8

5. Off Farm Income ($)

(a)	Off farm wages	
(b)	Remittances	
(c)	Handicraft	
(d)	Pension	
(e)	Social Welfare	

	25
	26

Rank(descend

ing order)

	27
	28
	29

6. Family Labour

Endowment

Man Equivalents	Less than 9 years=0 9-15years=0.7 16-49 years=1 Above 49=0.7

Total Man Equivalents	30

1.   Do you save some of your farm and non farm income

(a)	Yes (always/sometimes)	1
(b)	Never	0

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2.   Are you aware of banks or other financial institutions   that provide farm credit?

(a)	Yes	1
(b)	No	0

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If no please ask question 3/ If yes go to 4

3.   What are the reasons for you unawareness of these financial services

(a)	Not aware of any formal financial service provider in my area	1
b)	The local banks do not service farmers	2
c)	Not knowledgeable about farm credit	3

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4.Did you apply for an agricultural loan from formal sources last season

(a)	Yes	1
(b)	No	0

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If "Yes" please answer 5 if "No" go to question 6

5. In the last application for a loan what was the results

Loan application denied	Q		35
Approved but lower amount than applied for	R		36
Happy with approved amount	P		37

6.   Why did you not apply for a loan last season

Afraid application will be denied	Q
Afraid of losing collateral	R
I had Enough savings	P

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	39
	40

6. **Distance to nearest formal financial service provider**

(a)	0-5km	1
(d)	More than 5km	0

	41

7. **Does the farmer fear the risk to take a loan**

(a)	No	0
(d)	Yes	1

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8. Do you have a business plan

a) No	0
b) Yes	1

	43
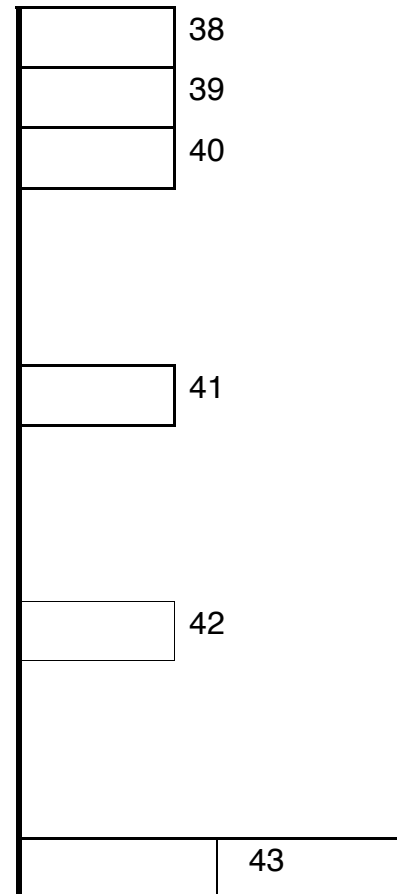
Thank you for participating in this survey